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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

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WORLDWIDE REPORT
NUCLEAR DEVELOPMENT AND PROLIFERATION

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FRANCE TO SUPPLY NUCLEAR FUEL REPROCESSING TECHNOLOGY

OW221147 Tokyo KYODO in English 1055 GMT 22 Jan 87

[Text] Tokyo, Jan. 22 KYODO -- Technology for Japan's planned first nuclear fuel reprocessing plant will be obtained from France's Societe Pour les Techniques Nouvelles (SGN), a Japanese company undertaking the project said Thursday. SGN will provide 28 billion yen worth of technological designs possessed by France's Atomic Energy Commissariat (CEA) and the state-operated nuclear authority Cogema, company officials said.

Japan Nuclear Fuels Services, which is majority-owned by a consortium of electric power companies, expects in the near future to conclude contracts procuring the French plant designs plus additional technology from Britain and West Germany, they added.

Construction of the plant, which will reprocess spent nuclear fuel, in Rokkasho village, Aomori Prefecture, northern Japan, is scheduled to begin at the end of fiscal 1990 under the supervision of Mitsubishi Heavy Industries Ltd.

/8309
CSO: 5160/025

SAFETY SYSTEMS AT PAKS NUCLEAR POWER PLANT

Budapest UJ IMPULZUS in Hungarian No 24, 29 Dec 86 pp 8-9

[Article by Redei: "Power Supply Security"]

[Text] The safety of nuclear power plants was always a subject of debate. Nuclear power is the first industrial technology in the case of which great attention was turned to safety from the beginning, and even economic questions were made subordinate to it. Where necessary they reckoned with tornados, flood, earthquake and flight paths. But the lessons of the reactor accidents of recent times have forced experts throughout the world, and in our homeland also, to take new steps.

The principle, the safety philosophy valid since the beginning of the 1970's, in the spirit of which they designed the VVER 440 blocks now operating here and the 1000 block to be built, is still correct and meets the international prescriptions in every respect. Accordingly, as the maximum planned failure, they took into consideration a sudden cross section break in the largest main circulating pipe of the primary cycle together with a bilateral outflow of the primary side heat carrier. The concrete plans contain technical solutions which also guarantee, on the occurrence of any initial event considered, that more radioactive material than permitted will not get into the environment even if an active element or a passive element working with a moving mechanical part should fail independent of the initial event. Perhaps the most important lesson of Chernobyl was that in the course of operations control should be mechanized better than it had been, that less should be entrusted to humans, whose role in the course of planning is indispensable and increasingly responsible.

Domestic developments and modifications are going in this direction also. In the case of the VVER 1000 block to be installed the new ideas are being taken into consideration at the time of planning; in the case of the operating blocks a number of new technical solutions serve greater safety. A special air exhaust system will be built in the near future in the 440 blocks of the Paks Nuclear Power Plant to remove the hydrogen arising in the event of a primary cycle failure. This will prevent the mixing of the hydrogen and the atmospheric oxygen, that is the development of conditions for an explosion. They will increase the cooling security of the active zone with cross connections which will eliminate water seals arising in the main circulating

lines in the event of a pipe break. The reliability of feed to the steam generator will be increased, certain protection logics will be modified and the failure feed water system equipment will get supplementary protection against mechanical effects which may occur in the turbine hall.

The evaluating system will be modernized in the interest of fire protection, the possibilities of contaminating the fire fighting water will be reduced and the possibility and reliability of automatic interventions will increase. Fire resistant oils will replace the presently used mediums in the oil systems exposed to increased fire danger. In addition they will regularly check and improve the operational regulations at the power plant and the preparedness of the operators, who will get practice on a most modern simulator.

Additional new solutions will increase security in the 1000 block. One of the basic goals of the developments is to make possible selective operation of the blocks, so that in the event of a failure in any block the others can operate undisturbed.

The control technology of the power plant is being modernized first of all. They are creating a complex diagnostic system which extends to the building structure of the power plant and the status of the technological equipment. A computer collects and evaluates the measurement results and signals of the built-in instruments, provides constant information about the status of power plant equipment and makes possible intervention before a failure can occur.

According to the plans they will build a system with the aid of which the blocks can be controlled from outside their own control technology centers, from another block or even from a center outside the area of the power plant. Thus, in the event of a failure, an emergency shutdown or continued operation of blocks not affected by the failure can be solved up to a determined level.

Safety cooling water supply is being modernized. They want to develop a system in which the blocks can mutually provide each other with a reserve.

They are studying the possibilities of developing an air condensation supplementary cooling system. At present the reactor is cooled with a cooling acid [hutosavas] method at the time of a failure or when it is impossible to take water from the Danube.

Connection to the electric network is being developed so that the connection will be maintained even in the event of a double failure and so that selective separation of the several blocks will be possible.

The safety system of the reactor can be broken down into protective, localizing, service and control systems.

The Protective System

The protective system includes the emergency protection of the reactor and the emergency zone cooling system. The first failure protection system of the reactor is the simultaneous dropping of all 49 control rods into the lowest position in a maximum of 4 seconds. The emergency zone cooling system consists

of a machine group consisting of four hydroaccumulators and three high pressure boron spraying pumps, three concentrated boron solution tanks, a machine group consisting of three emergency cooling pumps, a 500 cubic meter emergency boron solution tank, emergency cooling heat exchangers, pipes and fittings.

The Localizing System

The localizing system includes the hermetic covering, the isolating fittings and the sprinkler equipment. The passive localizing structure, or containment, is a reinforced concrete covering with an internal hermetic covering. It is cylindrical in form with a spherical cupola, a diameter of 45 meters, a height of 55 meters and walls 120 centimeters thick. Shields and obstacles protect it against flying objects. The sprinkler equipment includes, in addition to the pump machine group, hydrazine hydrate tanks and water jet pumps.

The Service System

The service system includes the safety electric power sources (diesel generators, storage batteries) and the safety cooling water supply. Three battery banks and three diesel generators can provide electric power for the safety systems.

The cooling water system for vital consumers consists of three independent subsystems. Each of these includes two cooling water pumps and open buffer tanks which are placed at a high point. This protects the system from being emptied in the event of a break in the electric power supply. Fountain type basins serve to cool the cooling water; these have reserve recharging. On the pressure side of the cooling pumps there is a control valve operating in parallel with the consumers to maintain the level of the flowing water.

The Control System

The control system contains the automatic instruments and the control circuits for the safety systems. In the event of the "large flow" signal or complete failure of power to the power plant the diesel generators and a stepped taking up of the load start with the aid of the safety control systems. The armatures are controlled on the basis of technological impulses; every single intervention organ is capable of continual operation until the impulse is generated.

It is not possible to switch off the failure mechanism until the appropriate authorizing technological impulse is generated.

In addition to these technical solutions the putting into operation of the new power plant simulator will be of great significance from the viewpoint of safety. The reactor physics experts of the KFKI [Central Physics Research Institute] are developing this now in cooperation with Finnish experts. This simulator--one of the most modern in the world--will serve to train the operators of the Paks Power Plant and keep their knowledge up to date.

New Block Producing at Full Capacity

The third block of the Paks Nuclear Power Plant, which was connected to the national electric power net on 28 September, is already producing at full capacity. The strict operational tests performed in the meantime showed that the equipment of the new block was operating perfectly so they could go up to the 440 megawatts, representing 100 percent output, earlier than planned. Thus the nuclear power plant is capable of an output of 1,320 megawatts and it provides one third of the domestic electric power production. All together the three blocks provide the country with 30 million kilowatt-hours of electric power per day.

According to the plans the fourth 440 mW block will go into operation in 1987 and the 1,000 mW power plant block being realized within the framework of an agreement signed recently with the Soviet partner will be started up in 1995. A second 1000 block is expected to begin operation around 1999.

8984
CSO: 5100/3005

NUCLEAR PLANT PROPOSAL FOR ENTRE RIOS REVEALED

PY030141 Buenos Aires NOTICIAS ARGENTINAS in Spanish 1404 GMT 2 Mar 87

[Text] Buenos Aires, 2 Mar (NA) -- A reliable source has revealed that, under a proposal soon to be submitted to President Raul Alfonsin by the NEA, a fourth Argentine nuclear plant would be located in Hernandariea, Entre Rios Province.

The source also said that the proposal will be based on the PHWR (Pressurized Heavy Water Reactor) Argos 380 Nuclear Plant Project, which was developed by the Argentine Nuclear Enterprise for Power Plants (Empresa Nuclear Argentina de Centrales Electricas -- ENACE).

For several reasons, according to the source, this project was given preference over the Atomic Energy of Canada Limited (AECL) project, which practically excluded itself because Canada would not authorize Argentina to export power plants manufactured in Argentina with pressure tube vessels [recipientes de tubos de presion]. CNEA President Alberto Constantini may have been informed of this decision by AECL Vice President Jaques Terrien at a recent meeting.

The purpose of the project, developed by ENACE, an enterprise in which CNEA owns 75 percent of the stock and the FRG KWU [Draft Work Union] Siemens Group owns the remaining 25 percent, is to export 380-MW Argos power stations that use pressure tube vessels.

According to Presidential Decree 432/86, on 21 March the CNEA should submit to the president of the nation a proposal for a nuclear power plant that uses a natural uranium-heavy water reactor to meet the country's objective of installing before the year 2000 the capacity to generate another 700-MW using atomic energy. The proposal should also suggest a site for the installation of the power station.

The source did not explain the reasons behind the decision to suggest that the power station be installed in Hernandarias, Nogoya Department, Entre Rios Province.

The cost of the Argos PHWR power station is estimated at $900 million. The plant, which has a 40-year lifespan, can be built entirely in the country, according to information provided by ENACE.

The general characteristics of the Argos 380 PHWR power plant are similar to those of the Atucha II nuclear plant, which is scheduled to go into operation in 1992.

Argentina now has two nuclear power plants in operation: Atucha I (FRG technology) in Buenos Aires Province, and Embalse Rio Tercero (Canadian technology).

Under the agreement with the FRG to build Atucha II, Argentina can use the technology to develop its own nuclear power plants and export them, provided the purchasing countries sign the pertinent safeguards.

The model that will be submitted to President Alfonsin can be adapted to the power grids in countries that have attained an intermediate level of development and its cost will make it available to less developed countries.

/9738
CSO: 5100/2072

NEW FUEL CYCLE TECHNOLOGY TERMED PRIORITY

Buenos Aires REALIDAD ENERGETICA in Spanish No 22, 86 pp 68-69

[Interview with Dr Raul Boix Amat, nuclear projects and technology manager of TECHINT, S.A.]

[Text] Before responding to the questionnaire you have submitted to me, I would like to make it clear that I will try to restrict my opinions to the nuclear area; I have two good reasons for doing so.

You know that TECHINT, given its size and in spite of its diversification, works in a number of different areas with a high level of specialization. As my area of responsibility in the company is the nuclear field, my first reason [for this limitation] is that I believe my answers will be more appropriate if I limit myself to that topic.

The other reason is related to my conviction that the nuclear sector has features which clearly set it apart from other energy sectors, and for that reason it requires specific consideration.

I should mention some of the characteristics which distinguish the nuclear sector in Argentina, as this will help us to conceptualize the answers:

a. Either directly or indirectly, the state maintains a monopoly on the nuclear industry. It thus provides the only internal demand for goods and services for this industry.

b. Despite the strong capacity for research and technological development in this area, especially in the public sector, because of management limitations this capacity is less than what might be expected, based on the excellent human resources we have.

c. At the present time, investment in this sector is almost exclusively public; most of it will not produce any returns in the short term, and while there was a slow recovery last year, it is still far below the levels we reached at the end of the past decade.

d. The sector is now at the starting point of its development, and possesses the greatest energy and economic potential for the long-term period.

e. Internationally, increasing restrictions are being placed on the transfer of nuclear power-generating technology (including fuel cycle technology), and there is a strong tendency toward the monopolization of this technology by some of the more advanced countries in this field.

The latter two factors are closely interrelated; there can no longer be any doubt that nuclear electricity will continue to increase in relative importance until, by the middle of the next century, it becomes humanity's principal energy source. Provided that no nuclear war intervenes, we expect the economic volume of the worldwide production of "nuclear goods and services for peaceful purposes" to reach the phenomenal figure of $25 billion a year. This is equivalent to about 500 times Argentina's foreign debt a year. So, if Argentina is able to provide just 1 percent of this production, our grandchildren could provide the world with nuclear goods and services in the amount of our present foreign debt, approximately every 70 days.

Of course, a major national effort is needed if we are to achieve this small percentage, for our present level of participation in this production is far below 1 percent. Nonetheless, we do have in our favor the fact that very few of the world's nations have mastered the basic fuel cycle technologies, as Argentina has, so that it is only a question of deciding to keep up a growing rate of investment in this area.

Beyond the flaws which any such long-term perspective may contain, nuclear energy, whose military applications are today a tool for political domination, will tomorrow certainly becomea tool for economic domination, through these peaceful applications. For this reason, we must act just as the more developed nations do and start preparing ourselves now, and preparing our children as well, so that they will be able to make decisions in this field.

Unfortunately, Argentina's economic situation strongly induces us to favor investments which produce short-term returns. For that reason, it seems sensible to me to orient part of the depressed level of investments in this sector toward the development and production of goods and services in the areas of radioisotopes and radiation. For these applications, investments much lower than those required for the production of electricity from nuclear energy can yield short-term results,and in our present economic situation, they could help to maintain our existing infrastructure. Nevertheless, even while fully recognizing the importance of these activities for the health and well-being of the population, and without meaning to slight the economic benefits which their export may provide, we must always remember that our nation's economic domination or its economic development will come from nuclear power plant applications.

Question: Considering your company's need for promoting development and increasing its activities, what projects should we be promoting in the short-term?

Answer: I certainly believe this lengthy introduction was necessary for me to be able to answer the first of these questions. Through its nuclear projects and technology division, TECHINT nas developed a good ability to work with the CNEA [National Atomic Energy Commission] on almost all its projects. For this reason, our interest is concentrated on projects which are a priority for our country, and among these, on activities that the CNEA has not totally monopolized itself.

In my opinion, in order to define our priorities we have to remember that the nuclear plan is essentially a technological and industrial devleopment plan in an area of such great economic potential that it has already led the more developed countries to start protecting this future business endeavor by putting up increasing barriers against entry. If our country had no possibility of participating in the international supply of goods and services for the nuclear industry, the answer would be very simple: we should limit our investments to projects in the area of radioisotopes and radiations, which not only require smaller investments but also enable the investments to be recovered in a few years, and we should indefinitely postpone our development of nuclear power plants. That would allow us to immediately contain spending in this sector, and it would also mean meekly accepting our future energy dependence. But not only has our country already invested 37 years of work in this field; in addition, it has demonstrated that it really does have this potential and a strong interest in pulling itself up out of underdevelopment. oo the answer is neither easy nor absolute. The nuclear plan will still continue for a number of years to drift about in a sea stirred up by economic interests, and for this reason our policy must be flexible, and it must be able to adapt to circumstances. Right now, our priorities lie in fuel cycle technologies, whose mastery will guarantee us a certain freedom of action, and in general, in supplies tc nuclear power plants.

This same set of priorities naturally includes the completion of all th projects now in progess, first of all the Atucha II programs.

Radioisotope and radiation projects can generally be situated on a second priority level, with the exception of those whose investments can be recovered in the short term. Such projects should be analyzed and decisions should be made about them as they would be for any other investment. Finally, it will be necessary not only to decide as soon as possible on the type of module for the fourth plant, but also to formulate, based on this plant, a real development plan for the nuclear power field, one which will favor local design and the participation of our national industry in the development of technology and the supply of goods and services for this and future plants.

Question: What might be a viable formula for generating investments?

Answer: Argentina's national industry is in the hands of the state. The private sector only produces part of the goods and services for this industry.

So if things do not change, investment in this sector will continue to be primarily public, and will thus be dependent on the CNEA's budget, and on its greater or lesser management efficiency.

In the past, private investment in the development of infrastructure to produce the goods and services which the CNEA and its subsidiaries buy did reach high levels. Genuine investment, that is, investment which was not totally absorbed in the price of the goods or services provided, reached levels of 12 percent in this sector's total investment.

Although in 1980 I estimated that it could rise as high as 37 percent, today the reality is that it is less than 2 percent, and only a very small number of companies are actually involved in these investments.

Perhaps ours may be one of the few private companies that is still investing in research and development in this field; but this effort is still far from producing any economic benefit other than what is derived from increasing the efficiency of our services to the CNEA and extending their applications to other industries.

Private investment in infrastructure can only grow along with the expected demand for goods and services. In 1980 there was an expansion plan for this sector, which the nation's economic situation then caused to evaporate, doubly penalizing genuine private investment. I say "doubly" because on one hand demand fell when the CNEA's budget was cut, and also because, as the CNEA tried to preserve its human resources and those of its subsidiaries, it moved ahead considerably into the production of goods and services for the nuclear industry, which to a certain extent had in the past been provided by the private sector. Without a market, and as the practice of the CNEA's direct contracting to its subsidiaries spread, the private sector was forced to cut its investments in this field.

It should seem obvious that, in order to increase private investment, these trends must be turned around, since public investment can only be recovered at the expense of other sectors of the government. But it is never easy to achieve the obvious. And in this case it it even harder, because it requires a change in ways of thinking.

a. In the first place we have to understand that the nuclear plan is a plan for the entire community which directly or indirectly contributes to its support, and that local private industries also form part of this community.

b. In the second place, it would be helpful if we realized that the state will not be able to support by itself alone the investment needed for our country to break through the barriers blocking entry into this field, and that if we do not obtain sufficient private capital investment, it is likely that our attempt will become bogged down, resulting in just an increase in government spending.

c. Finally, given the necessity for capital investment in this sector, we must also realize that business profits not only are not a sin, but are rather the only way to attract such investments.

I believe that, considering all these factors, it is possible to attract investments to the sector by means of close cooperation between the public and private sectors in the formulation and execution of the nuclear plan. This cooperation must be governed by the premise that each party will do what he does best and can do most efficiently. In that way we should also be able to avoid the development of a redundant infrastructure, thereby reducing investment requirements.

Question: What sectors do you consider priority areas for trying to introduce new technologies?

Answer: I have already said that some developments in the areas of radioisotopes and radiations, particularly equipment for nuclear medicine, irradiation plants, etc, should be evaluated and decided on as private investments; that is, in market terms, capital at risk, repayment time, and rates of return, without considering issues such as social benefits or costs, factors which are often considered in justifying state investments.

For this reason, it seems to me that the sector's major effort to incorporate new technologies should concentrate on the area of nuclear power plants and their fuel cycle. I would list as very important the development of mixed fuels, the development of new thermal reactor concepts such as the CAREN, and the development of fast reactors. But I believe that our greatest effort should focus on the development of our fourth plant which, no matter what its core, should be handled by ENACE [Argentine Nuclear Power Plants Enterprise], developing all the design phases locally in close collaboration with Argentine industry. For there can be no doubt that the level of "Argentinization" we achieve in this plant will be a decisive factor determining our nation's future potential in this field.

7679
CSO: 5100/2061

CNEN CITES POTENTIAL REGIONS FOR WASTE DUMPS

Sao Paulo FOLHA DE SAO PAULO in Portuguese 18 Oct 86 p 12

[Text] Bahia is the state with the greatest number of "potential regions" (five) for the construction of waste dumps (nuclear waste) from the Angra dos Reis Nuclear Center (154 km west of Rio de Janeiro, on the state's southern coast). Minas Gerais follows with three regions, then Rio Grande do Norte, Ceara and Piaui with two each. Pernambuco, Paraiba and Rio de Janeiro have one region each, the one in Rio situated 350 km north of Angra dos Reis.

The locations of the regions were identified yesterday by Paulo M.C. Barretto, 48, Director of the Department of Training and Scientific Support of the Radiation Protection and Dosimetry Institute of the CNEN, at the close of the seminar sponsored by the International Agency for Atomic Energy (AIEA) in Rio.

According to Paulo Barretto, another potential region (area 3 on the map) "is located on the ocean floor opposite the central part of Rio Grande do Sul, at a depth of 3,500 to 4,000 meters, 1,200 km from Rio de Janeiro." Area 4 on the map "the Trindade and Martin Vaz Islands, is also a potential region," according to Barretto. Area 1 on the map, he said, "is at the base of the continental shelf, 2,800 meters deep and approximately 300 km from the coast of Sao Paulo and Parana, and area 2 is some 900 km from the Brazilian coast, at a depth of 4,800 meters." On the map, areas 1 and 2 are considered "potential regions," but Barretto said that "they are being studied to conduct testing on the resistance and corruption of the containers, and are not intended to be studied as regions in which to construct nuclear waste dumps."

Paulo Barretto noted that this study began in 1978 and will be concluded within 3 or 4 years, when CNEN will have defined the best "potential region" for depositing the waste. According to him, CNEN will sponsor a series of debates between the authorities, the scientific community, ecological groups and the public, with the results of the study intended to be shown to the President of the Republic.

The head of the research and development project of Executive Directorate 3 of the CNEN, H.R. Franzen, 52, said that the decision "will be political," emphasizing "the need for a broad public debate."

Barretto said that "all areas we are revealing at the current level of information are capable of receiving atomic waste." According to him, "within a single potential region there could be several candidate areas which in turn may contain various potential local sites for the construction of the waste dump." On the choice of the Trindade and Martin Vas Islands, he said that "the area's local characteristics, such as degree of isolation and lack of mineral resources and vegetation, had been taken into account." He said that in that region "there is security because there is a naval base, but the difficulty lies in transport." He also said that "this does not mean that we simply want to toss nuclear waste into the sea; the reason we are conducting studies in these areas is because we need many alternatives before making the final decision."

1. Proposed dump sites for Angre Nuclear Waste

2. Potential regions

Sixty People Study the Leakage

The President of the National Commission for Nuclear Energy (CNEN), Rex Nazareth, 48, said yesterday in Rio that 60 people are involved in analyzing the tests made by Furnas Centrais Eletricas on the ANGRA I plant as a result of leakage in one of the reactor valves on the 30th. According to him, "a final date has not yet been set for conclusion of the testing," nor for the

CNEN to authorize putting the reactor back into operation. He said that on the 30th, "water was leaking at the rate of 15 gallons per minute," but he did not specify the length of time this took place.

According to Rex Nazareth, the fact that Jose Sarney has tied the CNEN to the office of the President of the Republic "is meant to give greater credibility and independence to the Commission in the public's eye."

The connection between the Commission and the President, according to Rex Nazareth, "will not change the scope of work of the CNEN because we cannot depopulate the agency, an agency designed for basic research." With regard to the potential regions, he said, "My duty is to guarantee that the technology utilized will not create problems for the environment or the population." In his opinion, "it is not easy to build facilities meant to remain in operation for over 300 years."

States Refuse Waste Deposits

Commenting yesterday on the inclusion of areas of Minas Gerais among those selected by the National Commission for Nuclear Energy (CNEN) as potential depositories for the waste from the Angra do Reis nuclear plant, Ronaldo Malar, 38, Director of Monitoring and Control for the Commission for Environmental Policy (COPAM, an agency of the Secretariat of Science and Technology) said in Belo Horizonte that he considers it strange that "until now we have not been informed about a project that involves the state. We are opposed to the idea in principal, but COPAM will not officially take a position until it receives the facts justifying the technical need for such a measure."

Celso Melo Franco, 23, member of the Minas Gerais Environmental Protection Association, said that "the public should be heard on the question before any decision is made." Melo Franco complained that the city of Caldas, 528 km south of Belo Horizonte, has been used for more than 12 years as a nuclear waste dump by NUCLEMON, a Grupo Nuclebras firm situated in the Santo Amaro region (in the southern zone of Sao Paulo).

In Recife, Pernambuco Government Press Secretary Aldo Paes Barreto, 46, said that construction of the nuclear waste dump "would be the worst thing that could happen to the state." According to him, Governor Gustavo Krause will "oppose the sending of nuclear waste to Pernambuco."

Salvador (BA) Mayor Mario Kertesz, 43, declared himself "completely opposed" to the idea of Bahia serving as a depository for nuclear waste. He stated curtly, "let he who dances pay the piper," referring to the fact that Bahia does not benefit from the energy to be produced by the nuclear plant. In Kertesz' opinion the problem, which he considers serious, "is regional," and should be resolved "by those localities benefiting from the energy produced by the plant."

13026/7051
CSO: 5100/2041

BRIEFS

NEW SUPERCONDUCTOR MATERIAL DEVELOPED--Buenos Aires, 19 Feb (AFP)--The National Commission for Atomic Energy (CNEA) reported today that a new ceramic superconductor material developed in Argentina has broken the record for the maximum temperature facilitating the flow of electric current without resistance. The experiment, conducted at the atomic center in Bariloche (1,700 km southeast of Buenos Aires), was similar to that conducted originally in Japan in November 1986, and repeated in the United States, when a record was established of 23 degrees Kelvin (over absolute zero). The Argentine scientists reached a record of 26 degrees Kelvin using a new ceramic metallic material, a combination of lenthanum, barium, copper, and oxygen, capable of enduring a characteristic temperature close to 30 degrees on the same scale. According to the CNEA, superconductivity is a property that some materials have of losing electric resistance at a certain temperature characteristic to each material. To achieve very low temperatures, some gases, such as helium, are liquified. Helium is scarce and relatively expensive, and for this reason it is important to have compounds and alloys that can operate at the highest possible temperature. This property has a great technological potential because it allows an electric current to flow without dissipating, and it is currently being used in the production of intensive magnetic fields in several areas, including that of medicine. [Text] [Paris AFP in Spanish 0602 GMT 20 Feb 87 PY] /9738

CSO: 5100/2072

TALKS WITH ARGENTINA FOCUS ON NUCLEAR COOPERATION

Rio de Janeiro O GLOBO in Portuguese 21 Nov 86 p 21

[Article by Jose Meirelles Passos]

[Text] Buenos Aires--After having achieved a perfect political understanding on the common goals of both countries with regard to the nuclear question, Brazil and Argentina are ready to take an unprecedented step: unite in order to undertake joint activities in this areas. This, in practice, means that in scientific as well as industrial activities there will be cooperation which will facilitate, among other things, the possibility of firms from the two countries being able to collaborate in order to construct factories not only in Brazil and Argentina, but in third countries as well.

The strategy for attaining this goal in the medium term will begin to be outlined in Rio de Janeiro between the 25th and 28th of this month, in the first meeting of the directors of the principal nuclear industries in the two countries. Called together by both governments, they will attempt to formulate a schedule which will, in theory, permit reciprocal cooperation.

One of the things we will decide will be bilateral purchases, on which agreement is needed in the nuclear industry," commented an industry source yesterday afternoon to O GLOBO.

The meeting, to take place in Rio, will actually be the third between technicians and high officials of the governments of Brazil and Argentina, since Presidents Jose Sarney and Raul Alfonsin signed a nuclear cooperation agreement exactly a year ago at Iguacu Falls.

"A preparatory meeting already took place several days ago in Brasilia, in which we had quite productive conversations on implementing the Protocol dealing with nuclear security in the two countries," said Minister Adolfo Saracho, Director General of Nuclear and Disarmament Affairs of the Chancellory of Argentina, when he confirmed the meeting scheduled to be held in Rio de Janeiro to O GLOBO.

Saracho affirmed that there is "a great deal of enthusiasm" on the part of both governments for cooperation between the directors of nuclear industries in the private sector to be increased. According to him, this similarity of views is a decisive step towards close collaboration between Brazil and Argentina.

"We are quite satisfied with the pace of the negotiations, since cooperation with Brazil is of high priority in nuclear affairs, especially our agreement not to manufacture nuclear weapons," the Minister said.

The large delegation from Argentina, which included representatives of the 13 principal nuclear industries of the 65 total in Argentina, will be led by Vice Chancellor Jorge Sabato, who will be accompanied by Engineer Jose Bernal Castro, President of the Argentina Association of Nuclear Technology (AATN), government officials, and representatives of the National Commission for Atomic Energy (CNEA). The Brazilian group will be led by Ambassador Sebastiao do Rego Barros, Chief of the Economic Department of Itamaraty.

According to the Argentines, the political aspects of nuclear cooperation will occupy the greater part of the conversations.

"A view to higher purposes prevents me from providing details of specific topics to be discussed in Rio. I can only say that we will talk of the development of mutual collaboration in this sector," said Minister Saracho.

Despite his reticence, motivated by "reasons of state"--as confirmed by other Argentine government officials--it is known that study groups will present a detailed report on 11 projects which Brazil and Argentina have already decided to put into practice.

13026/7051
CSO: 5100/2041

BRIEFS

INSTRUCTIONS ON PRESS COMMENTS--Military leaders and high officials involved in the parallel nuclear program signed with Germany in 1975 have received instructions from the National Security Council on how best to react to information divulged by the press on nuclear tests conducted by the Armed Forces. The classified document had been approved at Planalto Palace just before the departure of President Jose Sarney on his official visit to the United States last September 9. The recommendations were commented upon the day before yesterday during the meeting of the military leaders at the Aeronautics Ministry. FOLHA has found that these instructions remind the authorities of the need to constantly emphasize, in the public statements that will inevitably have to be made, Brazil's opposition to acquiring nuclear weapons--such as tactical or strategic bombs or missiles--even if these be vital to the country's development nor to mastering the complete nuclear cycle, which includes the process of enriching uranium. The Navy's request to the Ministry of Agriculture to exchange some 313 hectares on the Fazenda Ipanema (in Ipero municipality, 120 km from Sao Paulo), where the Aramar Experimental Center is being constructed, is in the hands of Secretary General of Agriculture Lazaro Barbosa. The Navy intends to construct a nuclear propulsion plant there for the first Brazilian nuclear submarine. [Text] [Sao Paulo FOLHA DE SAO PAULO in Portuguese 9 Oct 86 p 11] 13026/7051

ANGRA I OPERATION STATUS--The National Commission for Nuclear Energy, which monitors testing of the ANGRA I plant at Angra dos Reis (RJ), has no disagreements with the schedule set for putting the facility into commercial operation, which could occur in a week or in a month, according to a statement yesterday by one of the agency's presidential assessors. If during the general series of tests some other problem should arise, or a new defect become evident, everything in the commissioning process would begin again from ground zero. The ANGRA I plant is entering its fourth month of inactivity, with a daily cost of $1 million in current expenses and lost revenue to Furnas Centrais Eletricas. During this time, 380 km of secondary cooling pipes have been exchanged, the seawater being pumped out and removed, with new pipes having titanium connections, which possibly will be able to resist cracking and seawater corrosion. The nuclear fuel has also been replaced--one-third of the uranium pellets have been substituted with new ones--and testing on the plant was begun, which immediately suffered two reversals. A joint in one of the primary cooling system pipes showed evidence of a serious leak, with the loss of approximately 5 thousand liters of coolant. With the problem resolved and new tests initiated, one of the auxiliary diesel generator blocks began vibrating and was

removed. Technicians had to be brought from the United States at the request of Westinghouse to resolve the problem. They discovered that the generators would not accept PETROBRAS lubricants, thus requiring Furnas to again resort to importing the oils. At this time, ANGRA I is operating at 30 percent of its theoretical capacity of 626 megawatts. This capacity utilization should climb gradually to 90 percent, when CNEN will be able to approve it for commercial operation. Nuclear physicist Luis Pinguelli Rosa, professor at the Federal University of Rio de Janeiro, again criticized the Brazilian Nuclear Program yesterday at Sao Jose do Campos (SP). Pinguelli mainly criticized the transfer of the National Commission for Nuclear Energy (CNEN) to the control of the President of the Republic. "This is a mistake, because the program will be controlled by the Military Cabinet, and the Armed Forces already have a parallel nuclear program," he said. In his opinion, the nuclear program should be developed by civilian institutions. "If not, there is a great deal of risk," he warned, suggesting that the country should construct small reactors for medical applications. [Text] [Sao Paulo O ESTADO DE SAO PAULO in Portuguese 27 Nov 86 p 36] 13026/7051

CSO: 5100/2041

BRIEFS

LAGUNA VERDE AUGUST 1987 START-UP--One of the two reactors of the Laguna Verde nuclear powerplant will be charged with fuel at the end of January. It will start to generate energy in August 1987. The strictest safety measures will be taken when this fuel operation begins. These measures include evacuating the workers who are completing construction on the second reactor. The area will be cordoned off. Although there is no real danger, every possible measure will be taken to guarantee that the operation will be carried out without incident. Reactor No. 1 of Laguna Verde can generate up to 650,000 kilowatt-hours when it begins production in the second half of 1987. Ecological groups have opposed the start-up of the Laguna Verde nuclear powerplant which is on the Veracruz coast some 80 kilometers southeast of the port because they feel that it represents a serious safety risk for those who live in that zone. Nevertheless, the authorities have stated that it is almost impossible for an accident to occur. [Text] [Mexico City EXCELSIOR in Spanish 28 Dec 86 p 5-A] 7717

CSO: 5100/2069

COMMENTATOR: U.S. EQUIPPING PAKISTAN WITH NUCLEAR ARMS

LD080602 Kabul BAKHTAR in English 0439 GMT 8 Mar 87

[Text] Kabul, March 7, BAKHTAR — A political observer of BAKHTAR writes:

The ambitions of the Pakistani authorities for obtaining nuclear weapons have evoked the just and serious concern of Pakistan's neighbours as well as the rest of the countries of the region.

Dr Abdul Qadir Khan a well-known Pakistani expert in the field of nuclear energy has confessed that Pakistan has already produced nuclear-bomb. Right after his confession, Pakistani press came out to reject the Pakistani expert's confession. However, there exist strong indications testifying to what the Pakistani expert said, based on convincing reasons.

Following his confession, Rajiv Gandhi, India's prime minister, said in the Indian parliament that Pakistan has been secretly engaged in production of nuclear weapons in recent years.

Undoubtedly, the ambitions of Pakistani militarists to get nuclear-bomb exceed the defensive needs of that country and are aimed at further threatening its neighbours by resorting to force.

The history of the last three decades shows that dictatorial regimes of Pakistan had been the main factor of the tensions in the region and the wars between Pakistan and India. The large-scale military manoeuvres launched near the Indian borders during the last month has been the latest such actions of Pakistani rulers which caused further aggravation of the relations between the two countries. On the other side, the Pakistan's territory has been used as the main base and launching-pad of the undeclared war of imperialism against the DRA in the past eight years.

In equipping Pakistan with nuclear weapons, the role played by the U.S. Administration cannot be denied. Washington not only has not deterred Pakistan from producing a nuclear bomb, but has put all the necessary modern technology for production of nuclear bombs at the disposal of Islamabad.

Precisely in the framework of the U.S.-Pakistani military and economic deal, large amounts of modern armaments such as F-16 war planes, Harpoon missiles flowed into Pakistan. In the shortest period of time, Pakistan expanded and built new military bases with the help of U.S. Administration and officially announced the U.S. military forces could make use of some of the Pakistani military bases inside that country.

The militarist and bellicose policy pursued by Pakistani rulers on the dictates of Reagan's administration, runs completely opposite to the will of the majority of the people of Pakistan.

The people of Pakistan are faced with serious social and economic problems, which, in no way, can be solved by (?militaristic) and bellicose policies.

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CSO: 5100/4723

AL-WAFD ON NEED FOR ARAB NUCLEAR DETERRENT

PM171921 Cairo AL-WAFD in Arabic 12 Feb 87 p 5

[Article by 'Abd-al-Mun'im Husayn, chairman of the Wafd Party National Security Committee: "Israeli Nuclear Challenge and Its Danger to Arab and Islamic Nation"]

[Excerpts] It is common knowledge that Israel possesses resources that have enabled it to carry out its nuclear activities in both the peaceful and military fields during the past 30 years. Israel succeeded early on in creating a generation of scientists and technicians who received theoretical and practical training thanks to the scholarships and grants that world Zionism and the major powers have provided it with. This is in addition to the fact that Jewish scientists working in various fields in the world have supplied Israel with the secrets at their disposal. Israel also owns a number of nuclear reactors, some used for testing and research and others as nuclear power stations for the production of electricity and for sea water desalination.

Since its establishment and from the outset the Israeli nuclear energy institute assumed control of nuclear activities in all universities, technological academies, and test and research centers. It also took on the exchange of research and data with international research bodies and centers and invited eminent scientists in the nuclear field to visit nuclear centers in Israel and to deliver lectures. Thus it has been able to accomplish many researches in nuclear physics, nuclear chemistry and engineering, and safety and security against nuclear radiation dangers. It has also succeeded in accomplishing advanced applications in the use of nuclear isotopes in the fields of industry, agriculture, and medicine which have played a major role in improving its economy in the steel and iron industry, shipbuilding, textiles, plastics, glass, cement, pottery, paper, and food preservation.

Israel is also a pioneer among the states that have used nuclear energy for power generation and sea water desalination. It is also one of the most advanced countries in the field of solar energy, generating electricity from the wind, and artificial creation of clouds.

There is no doubt that Israel has been able to manufacture nuclear weapons and that in fact it possesses about 100 bombs as well as aircraft and surface-to-surface missiles to carry and deliver those bombs to specific targets in

order to achieve its strategy of primarily safeguarding its security and realizing its expansionist aims in the area.

Therefore, Israel's great activity in the field of using nuclear energy for peaceful purposes implies an economic threat to the Arabs just as its activity in the production of nuclear weapons implies a challenge to the will of the Arab nation and a threat to our national security. Addressing the recent Islamic conference which was held in Kuwait on 25 January 1987, ICO Secretary General Sharifuddin Pirzadah expressed his concern at the growing Israeli nuclear activity. He warned that Israel will not hesitate to use nuclear weapons in its possession should any crisis break out. He called on the Islamic countries to develop their scientific and technological capabilities in order to achieve independence in this field. He also argued the need to prepare and execute an Islamic nuclear program which would primarily aim at developing effective nuclear capabilities able to stand up in the face of Israeli nuclear capabilities.

In the light of these dangers which expose our security and that of the Arab and Islamic nation to danger, serious consideration should be given to the exploitation of all the resources and capabilities available to the Arab and Islamic countries with a view to overcoming all the obstacles that would prevent the achievement of superiority in the field of nuclear activity, in both its peaceful and military uses, and laying down a comprehensive plan aimed at achieving the following:

1. Expanding the use of nuclear isotopes in the various industrial, agricultural, and medical fields and especially the agricultural field, to which so far no share of such activity has been devoted in order to develop our economies in all fields.

2. Expanding the use of nuclear explosions for peaceful purposes in the field of oil extraction, canal digging, and the building of ports.

3. Building an Arab and Islamic nuclear power consisting of nuclear weapons and the means to carry and deliver them to their targets in such quantities as would make it possible to deter Israel and prevent it from imposing its will and achieving its expansionist designs and would be of sufficient strategic depth as would make possible the deployment of such force in a manner that would achieve for us a strategic advantage that will not be available to Israel in view of its limited area.

In order to achieve this our scientists who are experienced in advanced technology and sciences in this field should be summoned in order to lay down preliminary plans for the desired program. We should reward them generously and compensate them by providing them with all material and moral support.

We were pleased with the statements of Minister of War Production Engineer Jamal al-Sayyid on 3 February in which he announced success in manufacturing a comprehensive air defense armament system regarded as one of the world's

most advanced systems comprising antiaircraft artillery, ground-to-air missiles, and radar mounted on armored vehicles. He also announced that for the first time we now have the clear features of a military industrial base that has attracted the attention of various world countries. Although we are proud of what the minister of war production said, we cannot achieve a deterrent capability unless this military industrial base is developed to include all the nuclear activities that would enable it to produce nuclear weapons.

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CSO: 5100/4608

RADIO COMMENTATOR CRITICIZES LATEST U.S. NUCLEAR TEST

EK071435 Delhi General Overseas Service in English 1340 GMT 7 Feb 87

[Commentary by K. Dharmarajan of PTI entitled: "Nevada Test" Shattering Blow to Disarmament Campaign"]

[Text] If 1987 promised to provide a turning point in the campaign for nuclear disarmament, that hope has been shattered by the deafening explosion in the Nevada desert. The world watched helplessly as the United States authorities went ahead with a nuclear test last Tuesday. It was not as though there had not been nuclear testing in the past. What it especially adds to humanity's mounting concern, however, is that the 3 February American experiment may well force an end to the 18-month-old self-imposed testing pause by the Soviet Union and trigger an arms race.

The concern of India like the others involved in antinuclear campaign across five continents was pretty obvious. It was a moment of deep disappointment after entertaining hopes that the United States would respond to the six-nation peace initiative and match the Soviet moratorium.

The latest Nevada test was in defiance of world public opinion, including growing sentiments among people of the United States itself. Moscow had kept up the unilateral moratorium since August 1985. It did so in deference to the campaign, notably by the six-nation group, across five continents. While the Soviet testing sites have been quiet, the United States has carried out 20 officially announced and 4 unannounced nuclear weapon tests during the interim.

As the year 1986 was drawing to a close, the Soviet Union made it known that it would reconsider the moratorium after the first U.S. testing in the new year. Now in the aftermath of the Nevada experiment last week, the Soviet Union has indicated its plan to resume testing. Soviet officials in Moscow called the test conducted by the United States last week as provocative. They said the American administration has rejected the example of the Soviet Union and its calls to convert the moratorium into a two-way measure to halt the arms race. For its part, the Reagan Administration has spurned the Soviet proposals on nuclear arms as, what it called, dangerous nonsense.

Defending Washington's nuclear policy, a ranking defense official in Washington remarked barely 2 days before the Nevada test and we quote: Without testing, the USA and its allies would lose confidence in the weapons in their inventory. A comprehensive test ban, he claimed, would be dangerous and undesirable even if it were verifiable, which this one way not. Unquote.

It is well known that the six-nation disarmament group at its summit in Ixtapa, Mexico last August put forward concrete proposals to both the United States and the Soviet Union for verification of a moratorium. To check against clandestine testing, the six nations also offered to set up temporary monitoring facilities at existing test sites. Despite lack of adequate response it is clear the six-nation group will continue with its initiative for nuclear disarmament. Not long ago Prime Minister Rajiv Gandhi remarked and we quote: The first nuclear explosion reminded Oppenheimer of the phrase from the Bhagwat Gita: Brighter than a thousand suns. Yet, not all this brightness has enabled statesmen to see the light. Unquote.

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CSO: 5150/0089

PURCHASE OF SOVIET NUCLEAR PLANTS BEING CONSIDERED

Bombay THE TIMES OF INDIA in English 30 Jan 87 p 1

[Text]

NEW DELHI, January 29: The Soviet offer of large-sized nuclear power plants on easy credit terms is being examined by a group of experts led by Prof. M. G. K. Menon, member, planning commission and scientific adviser to the Prime Minister.

The offer has been hanging fire for some years now and India did not react favourably when it was made because of strong technical reasons.

Soviet nuclear power reactors do not fit into India's strategy of indigenous development, the key element of which is the use of thorium and not enriched uranium.

India also does not expect the Soviet Union to assure supplies of enriched uranium without conditions related to safeguards and with its bitter experience of the Tarapur plant, it is not keen to place itself in a dependency situation again.

However, one section in the atomic energy department is of the view that since indigenous rsources are limited, there is no harm in accepting the offer on the same grounds as those on which India was importing equipment for super thermal power plants.

This view gives importance to the argument that power generation capacities should be built up in the country at any cost.

The chances of India accepting the offer were rated very high even before the Soviet nuclear power industry suffered a setback because of the Chernobyl accident.

After the accident, the issue became even more sensitive and no one was prepared to even talk about it during the Soviet leader, Mr. Gorbachov's visit here.

But as is common in bilateral relations, the issue has been kept alive through the mechanism of further examination.

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CSO: 5150/0087

OFFICIAL SPOKESMAN ON PAKISTAN'S NUCLEAR PROGRAM

BK021619 Delhi Domestic Service in English 1530 GMT 2 Mar 87

[Text] India regards the Pakistani nuclear scientist's reported remarks as another confirmation of that country's nuclear program having a weapons orientation. The scientist, Dr Abdul Qadir Khan, who heads Pakistan's nuclear research program, is reported to have said in an interview published in a British paper that Pakistan has manufactured an atomic bomb.

An official spokesman in New Delhi, who was replying to questions by newsmen, said India views this with serious concern. He recalled the external affairs minister, Mr Tiwari's, statement in Parliament on Friday [27 February] expressing [the] government's concern over the nonpeaceful dimension of Pakistan's nuclear program. The spokesman added that a constant watch is kept on such developments as on all developments having a bearing on India's security.

Replying to a question, he termed as baseless reports that India has had contacts with Israel in connection with an alleged plan to strike against Pakistani nuclear installations. He also said that the insinuation that India has manufactured an atomic bomb is mischievous, false, and baseless.

Several members in both houses of Parliament expressed grave concern over the statement of the Pakistani scientist. In the Rajya Sabha the opposition as well as the ruling party members joined Mr Kapil Varma, Congress-I, in demanding a review of India's defense preparedness. In a special mention, Mr Varma said that a grave threat to the country's security has arisen and the government must announce its policy on the sensitive subject.

In the Lok Sabha, Mr Shantaram Naik, Congress-I, and some other members raised the issue during the zero hour. Mr Naik wanted the government to make a statement on whether it will excercise the nuclear option. The deputy speaker, Mr Thambidurai, said that this is a serious matter and he has received a calling-attention motion on the subject.

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CSO: 5100/4722

SECURITY POLICY URGED DUE TO PAKISTAN NUCLEAR STATUS

BK080600 Delhi Domestic Service in English 1530 GMT 7 Mar 87

["Spotlight: Pakistan's Nuclear Program" by K. Subrahmaniam, director of the Institute for Defense Study and Analysis]

[Text] The disclosure of Pakistan having developed a nuclear weapon by Dr A.Q. Khan, the head of the uranium enrichment facility at Kahuta, in his interview to Mr Kuldip Nayyar on 28 January 1987 comes as no surprise to those who have been watching Pakistan's progress in this field over the years. In spite of Dr Khan's successive but different versions of denial about the contents of the interview, Mr Nayyar's version stands corroborated by Mr Mushahid Hussain, editor of Pakistan's English daily, *Muslim*. Dr Khan's disclosure on Pakistani possession of a nuclear weapon is not an abrupt one.

Some months back the eminent U.S. journalist Bob Woodward, basing himself on information obtained from U.S. intelligence sources, wrote in *The Washington Post* that Pakistan was only two screwdriver turns away from the bomb. Before that came news about Pakistan having crossed the U.S. indicated limit of uranium enrichment level, Pakistan's testing of triggering mechanism for a bomb consisting of an imploding device of conventional explosive means, Pakistan's purchase of flash X-ray machines, clandestine attempts by Pakistanis with links with Pakistani atomic energy commission to smuggle krypton switches out of United States, and U.S. intelligence reports about Chinese assistance in designing the weapons etc.... To be fair to Pakistan it never made any secret of its quest for nuclear weapons capability.

They withstood the rigors of United S[illegible] cutting off all aid to them in April 1979 following the discovery that they were engaged in uranium enrichment through sensitive methods ostensibly intended for weapon purposes since Pakistan had no peaceful use for it. They successfully bargained with the United States that in exchange for allowing Pakistani soil being used as a sanctuary by Afghan insurgents fighting against Soviet-supported Kabul regime and Pakistan serving as a conduit of arms to them, the latter should give them a waiver from their nuclear nonproliferation legislation known as Symington Amendment.

The United States by giving a 6-year waiver clearly abdicated its legal obligation generated by its own domestic legislation. Pakistan presumably decided to follow the example of Israel which has been having a well developed nuclear arsenal for perhaps 15 years and has been able to adopt an ambiguous policy in regard to its existence. On the one hand there were hints from most authoritative quarters that Israel has a nuclear weapons arsenal and on the other, very vehement denial to have none. Israel had proposed a nuclear weapons free zone in West Asia and at the same time has adopted a declaratory policy that they will not be the first to introduce nuclear weapons in the area nor will they be the second. They have now put on trial a former nuclear technician by name Mordekhay Vanunu for disclosing details of their nuclear arsenal to the British paper *The Sunday Times*. And at the same time they maintain they are not a nuclear-weapon nation.

The United States will not dream of invoking any penalty against Israel for having gone nuclear. Further, over the years Israel has been using its possession of unacknowledged nuclear arsenal to pressure the United States to supply them the most sophisticated conventional weapons. The underlying threat is if the U.S. refuses, the Israelis will declare themselves a nuclear-weapon power publicly, thereby upsetting the nonproliferation regime carefully put together over the years by the United States with support from the Soviet Union, the United Kingdom, and 127 other countries. The strategy of nuclear ambiguity has worked extraordinarily well for Israel and there is no reason why it should not work equally well for Pakistan.

The nuclear strategy is a highly arcane and esoteric one. Consequently, without understanding the background, many gullible people in this country are taken in by Pakistan's offer of nuclear-weapons free zone in South Asia and mutual inspection and such other beguiling proposals.

These people did not understand that, while such proposals have some relevance to stop acknowledged nuclear proliferation, they were of no effect in the case of nuclear ambiguous strategy — the heart of which is to blindly deny possession of nuclear weapons even while generating signals all the time to let other nations know that the country has them. There is presently much greater understanding of the use of nuclear weapons and most of the textbook knowledge of nuclear doctrines, based on theoretical strategic rationalization of the U.S. policy of the fifties and sixties, are today totally out of date. Today nuclear weapons are not regarded as instruments of war to be used in the battlefield or even against an adversary's assets and population. They are considered as instruments of terror, more useful in coercing an adversary through threat of use than by actual use.

One Pakistani strategic theoretician has cited that in Koran the angel promised (?Allah) that Lord will inspire the believers and strike terror into the hearts of the unbelievers and rationalized nothing strikes terror into the hearts of unbelievers, presumably most of us, than a nuclear weapon. This concept of striking terror in the heart of an adversary and dissuading him from embarking upon an action detrimental to one's interest is a core of the doctrine of deterrence.

Here again one has to clear oneself of generally prevalent confusion in regard to India's attitude toward nuclear deterrence and its implications for our security policy in future. When one considers our national security in the current international strategic environment what is more relevant is not what our attitude towards nuclear deterrent is, but what is the attitude of our neighbors and other major powers towards that concept. In endeavoring to ensure our security we have to operate on the belief systems and values of other nations which are in a position to pose threats to our security. Therefore, the fact that we do not subscribe to the doctrine of nuclear deterrence and we are pledged to bring about a world without nuclear weapons and we are doing our best to promote nuclear disarmament are not mutually exclusive propositions on the imperative need we face to ensure that this country does not face a threat of use of nuclear weapons against it.

In Dr A.Q. Khan's interview there was an implied threat though cast in defensive terms. He is reported to have said, I quote, let it be clear that we shall use the bomb if our existence is threatened, unquote. In the last 42 years of nuclear era, nuclear threats conveyed in situations of assymetry have generally worked. This happened in Korea in 1953, [word indistinct] crisis in 1958, in Cuba in 1962, and by Israel against its Arab neighbors.

Superiority in conventional forces does not compensate for nuclear assymetry. This is the considered military view among developed nations and from Dr A.Q. Khan's threat one should consider this also appears to be the Pakistani view. There is now no way to deprive Pakistan of its nuclear capability.

The current view of U.S. Administration has been spelled out by Mr Richard Perle, the U.S. assistant secretary of defense, who has given it before the U.S. Senate Committee on Governmental Affairs. He first distinguished in South Asia between a friend and ally of the United States, namely Pakistan, and the other which is not, namely India. He argued that cutting off military aid to Pakistan would only deepen its sense of insecurity and drive Pakistan faster to acquire nuclear weapons capability. Obviously, this line of argument will justify the United States continuing its nuclear supplies to Pakistan without putting pressure on Pakistan to curb its quest for nuclear weapon capability.

In such circumstances India will have to reconcile itself to Pakistan's nuclear capability and continuing flow of U.S. weapons to that country. There is very little to be gained in bewailing the U.S. arms aid policy toward Pakistan and their acquiescence in Pakistani nuclear quest nor is there any sense in moralizing about Pakistani nuclear quest. The need of the hour is to formulate a feasible policy which will safeguard Indian security taking into account Pakistan's and China's nuclear status and the interest of the two superpowers in South Asian region.

Our policy of working for nuclear disarmament need not come in the way of any pragmatic nuclear security policy. Today only the nuclear weapon nations are in a position to take the initiative in regard to nuclear disarmament. India has some credibility in this respect mainly because of the capability it displayed in May 1974.

Technology and resourcewise, India is in a position to formulate a security policy which will reassure our people that the newest nuclear security challenge can be faced by this country. At the same time in the present international strategic environment there are advantages in pursuing a policy of ambiguity on the lines of Israel and Pakistan instead of acknowledging a publicly announced policy of nuclear deterrence. In such a framework certain deliberate obfuscation of policy is a necessity even while trying to add to the uncertainties of our potential adversaries.

The increasing credibility in Pakistani nuclear capability is likely to add to the popularity of the military establishment in that country. So will the continued U.S. military aid and the economic support in the light of Pakistan progressively revealing its nuclear contours. The Pakistani paper, *Muslim*, called it the Islamic bomb a few days ago. It is also quite likely that Pakistan will be able to persuade oil exporting and affluent Islamic countries to step up their economic assistance. Pakistan's influence in the Islamic world, especially in terms of military training assistance, may be expected to increase.

Pakistan may also not be in a hurry to settle the Afghan issue. So long as Afghan insurgency continues it can expect the United States to tolerate its nuclear arsenal and to continue with its arms transfers. Once this has taken place for a sufficiently long period the situation will become irreversible. The resulting situation will be totally different from what we have been used to in the subcontinent in the last 4 decades and hence calls for new political and strategic thinking.

While situation of asymmetry between two adversarial nations increases to vulnerability of the nonnuclear nation, history demonstrates that situation of nuclear symmetry has led to stability and search for confidence-building measures. This happened in Central Europe, in China and the Soviet Union, and China and the United States. Therefore, a correct and creative policy by India can lead to the same kind of stability and confidence building in the subcontinent.

/8309
CSO: 5100/4723

EXPERT SAYS NUCLEAR REACTOR SAFETY MUST BE UPDATED

Madras THE HINDU in English 26 Jan 87 p 4

[Text] BOMBAY, Jan. 25.

Although nuclear reactors in the country have in-built safety mechanisms to avert any disaster of the Chernobyl type, there is need for constant monitoring and updating of safety techniques, according to nuclear scientists and radiation specialists who participated in a four-day 14th conference on radiation protection at the Bhabha Atomic Research Centre here from January 19.

While Dr. M. V. Ramaniah, Director, Radiological Group of BARC, claimed that the nuclear plants were so safe as to rule out any Chernobyl-type disaster because of the several pecautions and safety measures incorporated in the functional systems, Dr. K. S. Venkateswaralu, head of the Water Chemistry Division of BARC, said one characteristic of nuclear accidents in the world was that the disasters were caused by metal-water reaction. "This can happen in Indian reactors too because there is a possibility of reaction between zirconium and water", he said at a panel discussion on "lessons from Chernobyl and handling of nuclear radiation emergency".

Dr. Ramanish argued that the pressurised heavy water reactor (PHWR) in the country had incorporated trip settings and scrams (two independent systems) such that the system integrity remained always well within the safety limits.

Potent threat: But Dr. Venkateswaralu stressed that since all the reactors used a metal like zirconium which could also get involved in a reaction with steam, there was a potent threat of disaster unless adequate and specific safety measures were devised to avoid rupture of fuel channels and pressure tubes. However, he admitted that all the reactors had safety measures but improvement on the existing "cladding" was definitely welcomed.

Probe panel set up: Mr. S. K. Chatterjee, Director of Engineering, Nuclear Power Board said, the NPB had set up a committee to probe methods to reduce hydrogen formation in the metal-water reaction and in the event of this happening, how to contain it. Formation of hydrogen beyond a certain level increased the temperature in the reactor leading to explosion.

Suggesting methods of combat in the event of disaster, Dr. B. B. L. Sah of the Health Physics Division, BARC, recommended remote-controlled handling equipment in emergencies and protective equipment for fire fighting personnel.

Mr. M. S. R. Sarma, Director of Atomic Energy Regulatory Board, describing how an operator skipped many of the safety regulations at the unit No. 4 of Chernobyl which caused the explosion, said there should be a safety culture among the operators of nuclear plants. "There is a good training school in the country but the best lot coming out of this school are taken for design of power plants. Operation is not only closing and opening of valves. It is much more than that. Therefore, a culture for selecting some of these best for operation also should come into the organisation", he said.

Dr. A. Nagaratnam, president of the Indian Association for Radiation Protection, said there were 2,500 institutions engaging 33,000 workers in various fields like research, power generation, and medical, agricultural and industrial application of radiation. —PTI

/9274
CSO: 5150/0090

EXPERT DEFENDS SAFETY OF TARAPUR NUCLEAR PLANT

Madras THE HINDU in English 27 Jan 87 p 4

[Text]

PUNE, Jan 26

The Nuclear Power Board Chairman, Dr. M. R. Srinivasan, has described as "absolutely baseless" the charge by Drs. Helen and Bill Caldicott, the Australian couple championing the cause of a ban on nuclear power, that the Tarapur Atomic Power Plant had major safety hazards.

The couple had, during a recent tour of the country, described the Tarapur plant, 100 km from Bombay, as the "dirtiest and most dangerous" of its kind in the world.

The couple, speaking on 'human survival in a nuclear age' at a public meeting in Madras on November 26, had also pointed out that a serious accident to the two reactors at Kalpakkam could kill the population of Madras in two weeks and that the fast breeder test reactor could in certain circumstances produce an accidental nuclear explosion.

Dr. Srinivasan told newsmen at Walchandnagar, near here, on Sunday that the couple had made statements without visiting the plant or consulting the authorities concerned. The Tarapur plant had earned so far gross profits of Rs. 70 crores. Last year's profit alone was Rs. 20 crores.

The Chairman said all nuclear programmes in the country were aimed at giving people "minimum exposure to radiation" and added that natural radiation from cosmic rays or potassium in sea water was higher than that from nuclear power.

While agreeing that the Chernobyl and the Three Mile Island disasters had to be taken note of, Dr. Srinivasan said prior to these accidents, not a single fatality had been attributed to nuclear power although over 400 such stations were operating in the world.

Cause of Chernobyl disaster: The Chernobyl disaster was due to the lack of an automated safety system and the fact that at the time of the mishap it was in the hands of non-technical staff. Indian reactors have better automated safety features and shift engineers with adequate technical knowledge.

Dr. Srinivasan said even if accidentally bombed, nuclear reactors had enough physical barriers to control radioactive rays.

Earlier, he took charge of the Rs. 1.25-crore 'calandria' (a sealed vessel called the heart of the nuclear reactor), manufactured at Walchandnagar Industries Limited (WIL) for the Kakrapara Atomic Power Plant II (KAPP—II) which would be commissioned in December 1991 for producing 235 MW electricity.

Dr. Srinivasan said 20 to 25 per cent of the national electricity production was used for agricultural purpose, one third of the total for industrial purpose and the rest for household use.

The Chairman said if Indian industrialists could manufacture heavy machinery in lesser period, the country would be able to reduce the commissioning time of power plants to seven years (like France) as against 12 years now. Within the next 15 years, India would be able to produce 15 per cent of its electricity through nuclear power plants.—UNI, PTI

Rail car introduced

GWALIOR, Jan 26

A rail car, having a capacity to carry 154 passengers, was introduced on the Gwalior-Sheopur Kalan narrow gauge section of Central Railway. Having a maximum speed of 35 kmph, it will cover the 200 km distance in nine hours. It will be available from Gwalior on three days and from Sheopur Kalan on three days in a week.—UNI

/9274
CSO: 5150/0086

AEC CHAIRMAN, OTHERS, INTERVIEWED ON NUCLEAR ENERGY

Madras THE HINDU in English 20 Jan 87 p 10

[Text] MADRAS, Jan 19.

Greater use of nuclear energy — the most elegant and non-polluting fuel — is an essential pre-requisite to achieve faster industrial development of the country. Otherwise, the country would not be able to secure the objectives set by it in the long run, Dr. Raja Ramanna, Chairman, Atomic Energy Commission, told THE HINDU here today.

Dr. Raja Ramanna, who arrived here this morning from Bangalore, said that if power stations are located at the coal pit-heads, the cost of power generation as between nuclear stations and thermal plants would be more or less equal. As you moved away from the coal-bearing areas (for thermal power generation) nuclear energy would prove cheap, he said.

Cost factor: The Government had given priority to hydro-electric generation during the Seventh Plan. Hydel plants were located in remote and inaccessible regions and their gestation period was also very long, Dr. Ramanna said. If thermal stations were located at the coal pit-heads, the cost would be almost nil. But in States like Tamil Nadu which were far away from coalfields, coal had to be moved over greater distances and there was no certainty of coal reaching the power plants in time owing to various bottlenecks. The huge transport cost, added to cost of power generated, would only lead to increased cost for the user-industries in the State. In addition, thermal power from coal posed serious environmental hazards, but in the case of nuclear power, the 'fuel is clean' and did not pose problems to industries, he said.

MAPP's earnings: Dr. Raja Ramanna said that the Madras Atomic Power Project (MAPP), Kalpakkam, was earning about Rs. 150-200 crores annually now. He predicted that following the various steps taken by the Department of Atomic Energy, nuclear power generation in the country would reach the break-even point, resulting in a larger internal surplus which would more than offset the cost of erecting more and more nuclear reactors for generating electricity.

Dhruva reactor set right: The Atomic Energy Commission Chairman said, the problem of vibration in the Dhruva reactor — conceived, designed and erected with totally Indian technology — has been overcome now. The problem was highly complex in nature since it was an experimental reactor based on Indian expertise. "I may call this the most interesting experimental design made in the country." The generating units at the Rajasthan and the Tarapur projects were performing well, he said.

Radiation hazard ruled out: Replying to questions Dr. Raja Ramanna said, "There is absolutely no danger of radiation from any of the nuclear power plants operating now in the country. We are very conservative in our outlook and we take the maximum security precautions. There should be no comparison with what happened at Chernobyl in the Soviet Union. At Chernobyl, the engineers were monkeying with the reactor at a low speed, removing the safety mechanism. This was incorrect. In addition, the type of reactor used in Russia is used only in a very few countries in the world. We do not have such a type in the country for generating nuclear energy," he said.

Sharing MAPP power: Mr. K.S.N. Murthy, Director, MAPP, Kalpakkam, said the Tamil Nadu Government had wanted the project to generate and feed into the State grid 150 million units (MU) during January. "We have already produced about 130 MU till date and we hope to cross the State Government's request very soon. Both the units are performing very well, generating 180 MW and 190 MW respectively and the total 370 MW would be fed into the Tamil Nadu power grid. This is a good effort and the total power produced would be shared among Tamil Nadu, Andhra Pradesh, Karnataka and Kerala on a power-sharing formula evolved by the Union Government, he said.

Restarting FBTR: Mr. C. V. Sundaram, Director, Indira Gandhi Fast Breeder Test Reactor Centre, Kalpakkam, said this experimental reactor which was shut down to carry out tests and checks, would be restarted in the next couple of months for carrying out further experiments. He expected the unit to produce electricity to a maximum extent of three Megawatts, between the middle and end of 1987 equal to 10 million units of heat. An experimental fuel — a mix of plutonium and uranium carbide — was used to generate power. The experiments were taken up to study the possibilities of using fast breeder technology by converting vast quantities of

thorium as fuel. The process was uneconomical now, but in the long run, a break-even point may be reached.

Dr. Raja Ramanna participated at a function organised by the State Bank of India to distribute loans to farmers and fishermen at Kalpakkam. He gave away Rs. 5,000 each to five fishermen.

/13046
CSO: 5150/0083

REPORTS, COMMENT ON AEC STAFFING PROBLEMS

Extension to Ramanna

Bombay THE TIMES OF INDIA in English 1 Feb 87 pp 1, 9

[Text]

BOMBAY, Jan. 31.

BARELY a few hours before he was due to retire, Dr. Raja Ramanna, chairman of the Atomic energy commission (AEC) and secretary to the Department of atomic energy (DAE), was asked today to continue in both posts for another month.

The extension came after the Central government reportedly decided late last night on Dr. M. R. Srinivasan, chairman of the Nuclear power board (NPB), as his successor. But it had to rescind the decision after Dr. P. K. Iyengar, director of the Bhabha atomic research centre (BARC) threatened to quit.

Another senior scientist who was reported to have threatened to quit was Mr. N. Srinivasan, chief executive of heavy water projects, but he denied the report.

The decision to appoint Dr. M. R. Srinivasan was communicated to Dr. Ramanna around midnight and he, in turn, is reported to have informed the NPB chairman. News about the appointment spread quickly in the scientific community and telephone lines to Delhi soon began humming with threats of resignations, it was reliably learnt.

Both Dr. Srinivasan and Dr. P. K. Iyengar were at the Old Yacht Club, headquarters of the DAE, when a telex message extending Dr. Ramanna's tenure by a month landed around noon today.

More than personalities, the tussle between Dr. Srinivasan and Dr. Iyengar has brought to the fore the question of who should head the AEC and the DAE — an engineer or a scientist. As a nuclear technologist, Dr. Srinivasan is an engineer, while Dr. Iyengar is a scientist doing basic research.

Barring Dr. Vikram Sarabhai, who was director of the Physical research laboratory, Ahmedabad, at the time he succeeded Dr. Homi Bhabha, other occupants of the prized posts — Mr. H. N. Sethna and Dr. Ramanna — were both heading the BARC and, hence, deeply committed to research and development (R & D).

While Dr. Iyengar and Dr. Srinivasan are both rated high in their respective fields, Dr. Srinivasan staked his claim on grounds of seniority.

Till late last evening, Dr. Ramanna had no inkling of an extension. But the government's delay in announcing a successor to him also fuelled speculation.

At one time, there were rumours that an "outsider" like Mr. Maheshwar Dayal, secretary to the department of non-conventional energy sources, would succeed Dr. Ramanna. Such a step was viewed with great concern by the scientific community and top contenders of the post were prepared to quit.

The names of Prof. M. G. K. Menon, science adviser to the Prime Minister, and Dr. C. N. R. Rao, chairman of the science advisory council and director, Indian institute of science, Bangalore, were also mentioned in this connection and it was felt that should the Prime Minister find the internal competition for the top post unmanageable, induction of an outsider would result.

As news of the likely resignations spread, Dr. M. R. Srinivasan and Dr. Iyengar both went to the Old Yacht Club although it was a holiday, and the DAE headquarters buzzed with activity. Till 11 a.m., it seemed as if Dr. Srinivasan would take over, but events took a dramatic turn around mid-day when the telex message extending Dr. Ramanna's term came.

Dr. Srinivasan refused to comment, saying he did not know of developments in Delhi. But observers said the fact that the government had to rescind its decision indicated that Dr. Iyengar had won the first round.

Shortly after the telex, Dr. Ramanna, Dr. Iyengar and six others attended a private lunch that had been arranged earlier by Dr. R. K. Garg, chairman and managing director of Indian Rare Earths (IRE), to bid farewell to Dr. Ramanna and welcome the new incumbent. Dr. Srinivasan did not attend the lunch, however. He said he was invited only this morning at the OYC and could not attend as he had a "prior commitment at home."

For the scientific community the stakes in the appointment of a successor to Dr. Ramanna are quite high. Some feel that as an outstanding nuclear physicist, Dr. Iyengar would be an ideal successor because he would be able to push ahead in nuclear R & D.

His supersession, or exit, from the atomic energy scene at this time would undermine the position enjoyed by the BARC in the country's scientific establishments, it is felt.

The support for Dr. Srinivasan stems from his being a technologist. It is argued that the country now needs a capable person to execute nuclear power projects and achieve the target of 10,000 MW by 2000 A.D., than developing R & D which is already well-established.

Yet another name which figured among the probable successors was the heavy water projects chief executive, Mr. N. Srinivasan. He is noted for having successfully commissioned the heavy water plants which provide an important input to the nuclear power programme.

Another factor of significance is the growing nuclear capability of Pakistan and the need for a matching development. This situation favours a nuclear scientist. Thus, the choice of a successor should normally be based on the priorities set by the government of Mr. Rajiv Gandhi.

Procedural Problem

Bombay THE TIMES OF INDIA in English 1 Feb 87 p 1

[Text]

NEW DELHI, Jan. 31.

VIRTUALLY at the very last minute, the government today woke up to the problem of finding a successor to Dr. Raja Ramanna, chairman, atomic energy commission and secretary, department of atomic energy, and resorted to the easiest way out.

Dr. Ramanna was requested to continue for another month. Since he was to have retired today but for this last-minute decision, he would have handed over charge to an additional secretary in the department.

Even that would have created a problem in this sphere of activity since the additional secretary could not have got the powers of chairman of the atomic energy commission even for an interim period.

This was only a procedural problem, but even the danger of creating instability and demoralisation in this vital scientific department could not goad the government into early action paving the way for a smooth transition.

The problem of finding a successor did not appear overnight. Dr. Ramanna, 62, was already on extension for two years from January 31, 1985. In the case of senior-level scientists the retirement age is 60.

But there have been cases when scientific secretaries were given a second extension. This was done in the case of Prof. Satish Dhavan, former chairman of the space commission and secretary, space department, on the ground that space projects were in a critical stage and called for continuity in leadership.

In the case of the atomic energy establishment it was even more necessary to select the next leader of the large team in time to avoid internal conflict.

Two eminently suitable candidates for succeeding Dr. Ramanna are Dr. P. K. Iyengar and Dr. M. R. Srinivasan, both members of the atomic energy commission.

Dr. Iyengar is director of the Bhabha atomic research centre (BARC) and Dr. Srinivasan is chairman of the nuclear power board.

The next one month, for which Dr. Ramanna has been asked to continue, will also be used for reviewing the structure of the department, according to competent sources. The government may consider a proposal to separate power project activity from the research and development wing, each under a secretary-level in-charge.

While the R & D wing requires the leadership of a scientist, the power, nuclear fuel and heavy water projects, accounting for more than 70 per cent of the outlay, require the leadership of an engineer.

According to one view, the separation would amount to a rational restructuring of the department but some others feel that the present arrangement is more conducive to interaction between R & D and its application in projects.

On an earlier occasion, the department did have a principal secretary as well as a secretary when Dr. Ramanna was brought back to the department even as Dr. Homi Sethna was chairman of the atomic energy commission.

Power projects as well as R & D activities are expanding rapidly. Power projects activity requires massive funding since it is planned to raise the installed nuclear power capacity to 10,000 by the year 2000.

A series of 500 MW units is being planned and work has been initiated on four units of 235 MW each, two to be located in Karnataka and two in Rajasthan.

However, according to some experts, a decision to restructure the department should be taken after an independent assessment and not in terms of finding slots for individuals.

Government Statement Noted

Bombay THE TIMES OF INDIA in English 2 Feb 87 p 1

[Text]

NEW DELHI, Feb. 1.

THE government today reacted to the dramatic developments in the department of atomic energy in Bombay yesterday, by announcing that the next chairman of the atomic energy commission would be appointed "soon."

The official statement sought to deny that scientists in the DAE had resigned.

The cleverly-worded statement did not refer to the fact that Dr. P. K. Iyengar, director of the Bhabha atomic research centre, had indeed submitted his resignation after learning that his colleague, Dr. M. R. Srinivasan, was being asked to succeed Dr. Raja Ramanna as chairman of the AEC and secretary, DAE.

The statement also skipped the fact that a telex message had gone from New Delhi to Dr. Ramanna, asking him to hand over charge to Dr. Srinivasan. In fact, had the revised message from New Delhi asking Dr. Ramanna to continue for another month reached a little later, the formality of Dr. Srinivasan taking over as Dr. Ramanna's successor would have been an accomplished fact.

In fact, Dr. Ramanna should still have the resignation letter of Dr. Iyengar, unless he had destroyed it. The granting of one month's extension to Dr. Ramanna, who was to retire from service yesterday, was officially announced here yesterday. But no one was prepared to confirm the developments preceding this revised decision, even though a departmental spectacle had been created in Bombay. Official sources maintained that no appointment had been made.

The government in the statement also denied that a reorganisation of the DAE was being contemplated.

The official statement said: "The

government has not yet taken a decision on the appointment of a successor to Dr. Raja Ramanna as chairman of the atomic energy commission. A decision in this matter is expected soon. Reports in a section of the press that some scientists in the department of atomic energy have resigned are not correct. Reports about reorganisation of DAE are also not correct."

The scientific community here is surprised over the way in which the government tackled the problem of finding a successor to Dr. Ramanna for the post which ranks equivalent to that of the cabinet secretary.

Till the last minute, rumours were allowed to float in a situation of internal conflict within the department. It was stated that an outsider, currently secretary to the government, was also interested in heading the atomic energy establishment.

Dr. Ramanna, who should have been consulted normally about the appointment of his successor, was placed in an embarrassing position, as he could not preside over a smooth transition in the leadership of such a sensitive department. In fact, he had to contact New Delhi on his own for finding out who he could hand over charge to on the day of his retirement.

Observers recall the situation in the space department long before Prof. Satish Dhavan was to retire as chairman of the space commission. There were two prime contenders for the post, but the government gave due weightage to Prof. Dhavan's advice, took him into confidence long before the day of his retirement and managed the succession tactfully.

The delay and bungling in the appointment of Dr. Ramanna's successor will inevitably affect the functioning of the department which has already seen a polarisation between scientists and engineers, according to observers here.

Need for Best Qualified

Bombay THE TIMES OF INDIA in English 3 Feb 87 p 8

[Editorial]

[Text]

The shabby drama which ended in Dr. Raja Ramanna continuing as chairman of the Atomic Energy Commission for another month is only the latest instance of the cavalier manner in which the government has been functioning of late. This episode is on a par with the one involving the removal of Mr. Venkateswaran as foreign secretary. The vacillation on the appointment of a new chairman of the AEC falls into a pattern and does little credit to the government. It cannot but affect adversely the morale of the scientific community. The government has tried to explain away the confusion by claiming that Dr. Ramanna was scheduled to retire only at the end of February. This is too feeble an excuse to be taken seriously. For if this was the case, Dr. Ramanna would not have been sent a message at midnight on January 30 asking him to hand over charge by noon and the government would not have needed to announce on January 31 morning that he had been requested to continue in office for another month. These manoeuvres are typical and only gives a kafkaesque touch to the sheddy affair. When Dr. Bhabha and Dr. Sarabhai suddenly died in office, the government had to find a successor immediately. This time the government had known for the last two years that the position of the AEC chairman would fall vacant early in 1987. There was thus more than enough time first to identify the successor and groom him properly. Why the government did not do so is a mystery.

The choice of the next AEC chairman is a matter of great concern. From what has transpired over the weekend it is clear that seniority or personality traits have come to be given great importance in the selection. In fact these should have low weightage. The paramount criterion should be one of national priorities and imperatives. There is not the smallest room for doubt that Pakistan is poised to acquire a nuclear weapons capability. Whether it is two weeks or two months away from making the bomb is a matter of detail. The fact is that it has acquired the necessary capability. New Delhi can afford to ignore this reality only at grave peril. It cannot stand idly by while Islamabad goes ahead with its nuclear weapons programme. It has to give the topmost priority to the country's nuclear defence requirements. This should be the touchstone on which to judge the competence and expertise of the different candidates. One who is best qualified to meet this challenge, be he a scientist or an engineer, should be chosen. The government should then not give in to threats of resignation. Those who wish to leave should be allowed to go. Vital national interests cannot and must not be compromised in this field.

/9274
CSO: 5150/0088

BIHAR LOBBYING FOR ATOMIC POWER PLANTS

Bombay THE TIMES OF INDIA in English 26 Jan 87 p 23

[Text]

PATNA, January 25

BIHAR is slated to have two atomic power plants of 1000 MW each. The state government is trying to prevail upon the Centre for securing the final sanction regarding the two power plants.

The two sites that have been selected for the installation of plants are Jharua, near Chandil, and Baradih in Rohtas district. The sites have fulfilled all the initial conditions that have to be adhered to in relation to an atomic power plant.

The feasibility of atomic power plants in Bihar was discussed by Mr. L.K. Jha, the chairman of the commission on economic efficiency, productivity and exports, during his meeting with the chief minister, Mr. Bindeshwari Dubey, on January 18.

The present visit of Dr. Raja Ramanna, secretary of the department of atomic energy, government of India, is being taken as "very important" in connection with the approval and post-selection investigation of the two sites.

It was learnt that the talk regarding installation of two atomic power plants had been going on for sometime. The state government had offered five sites for the purpose. Following the inspection of the five sites by the site selection committee, the atomic energy department short-listed the number of sites to two, Jharua and Baradih.

Both the sites have fulfilled the four-point criterion, availability of water, availability of land, electrical load centre and the suitability of site. However, the atomic energy department wants a detailed report on geological conditions and seismic factors related to the sites.

It was learnt that the Indian meteorological department, New Delhi, has asked Roorkee University to do a detailed investigation regarding the geological and seismic factors connected with the sites.

The atomic energy department would sanction the installation of the two atomic power plants only after the Roorkee University submits the reports regarding the geological and seismic factors. The detailed designation of the two plants depends on the two reports.

It was learnt that the availability of water for the atomic power plant of 1000 MW capacity would be at the cost of irrigation to the extent it is utilised for the atomic power plants.

During his talk with the chief minister on January 1, Mr. Jha discussed the power situation in the state.

Among the six points discussed, the feasibility of two atomic power plants, whose sites have already been selected, the role of the Bharat Heavy Electricals Limited towards maintenance of existing power generating units in the state was discussed. Foreign aid for the Tenughat hydel power project during the second phase of its construction and the supply of appropriate coal for thermal power stations in the state which is entailing use of oil at a huge annual cost also figured in the talks.

The chairman of the atomic energy commission, Dr. Raja Ramanna, on Saturday lauded the performance of RAPS unit-II at Kota and said it was breaking records with its reliable performance.

Delivering a talk at the science college grounds in Patna, he said press reports about power unit shutdowns were often exaggerated. "Everybody writes when something goes wrong."

Making a strong case in favour of nuclear energy, he said the power generated from nuclear sources was much cheaper than that generated by conventional methods.

Consumers in cities like Bombay and Madras were receiving power at cheaper rates from atomic power stations. Given the resources, Dr. Ramanna said, the target of installing 10,000 MW of nuclear generating capacity by the turn of the century was possible.

/9274
CSO: 5150/0085

BRIEFS

PAKISTAN'S 'BOMB' VIEWED--India has expressed her anxiety at reports that Pakistan now has the atom bomb. The external affairs minister, Mr N.D. Tiwari, voiced his concern during the meeting with the Bulgarian deputy prime minister, Mr Ognyan Doynov, in New Delhi today. Mr Doynov is now a 5-day visit to India. Mr Tiwari also apprised the Bulgarian leader of the Indo-Pakistan talks to defuse tension on the western border. He said Pakistan's nuclear program poses a threat to peace in the region. The Bulgarian leader apprised India's stand of using nuclear energy for peaceful purposes only. [sentence as heard] [Text] [Delhi Domestic Service in English 1530 GMT 6 Mar 87] /8309

BHARATIYA JANATA STAND--The Bharatiya Janata Party president, Mr. L. K. Advani, and Mr. Atal Behari Vajpayee here advocated a review of India's nuclear policy. Mr. Advani said the time had come when the country should produce the nuclear bomb. Addressing newsmen here, Mr. Advani said the government's present nuclear policy would only weaken the country. "I feel India must produce the nuclear bomb as there is no alternative." Referring to reports about the concentration of Pakistani forces on the India-Pakistan border, the BJP chief said the situation had been worsening for quite some time, but he had "no doubt India would deal with firmly if Pakistan dared to attack it." Mr. Advani said the "mishandling" of the Punjab issue by the Rajiv Gandhi goverment and its failure to provide a security belt on the borders had led to a rise in infiltration from across the borders into Punjab, Rajasthan and Gujarat. This had endangered the security of the country and had resulted in a rise in terrorism, he added. Mr. Advani also demanded a blanket ban on foreign money brought in by private institutions including social, political, educational and cultural organisations. The funds coming from abroad were being misused by the organisation, he claimed. [Text] [Bombay THE TIMES OF INDIA in English 20 Jan 87 p 16] /13104

URANIUM THEFTS--The police seized 1 kg of uranium from a youth at Mugra Badshah railway station in Jaunapur district on Sunday. The youth was taken into custody and the uranium sent to the Benaras Hindu University for chemical examination. In May last year some uranium had been recovered from one Pramod Kumar Shrivastava by the Katra police in Mirzapur district. Three others arrested in this connection from Bhadoi had reportedly told the police that they had been smuggling uranium to Pakistan where it fetched several lakhs of rupees. [Text] [Calcutta THE TELEGRAPH in English 8 Jan 87 p 4] /13104

APPEAL TO REAGAN—All India Peace and Solidarity Organisation in an appeal signed by over 150 well-known people from scientific, educational, cultural, trade union, political and other fields called upon the US President and the Congress to turn back from the precipitous action of conducting another nuclear weapons test. A copy of the appeal was released at a press conference on Thursday. Addressing newsmen on behalf of the signatories to the appeal and AIPSO, former diplomat P. N. Haksar said if the US conducted another nuclear test it would be a crime against humanity. He pointed out the USSR had unilaterally imposed and continued to observe a moratorium on tests for nearly a year and half, but the US had disregarded adamantly both world opinion and enlightened self-interest and carried out about 24 tests in that period. If the US conducted another test the USSR might feel free to resume testing, and the US, by another test, would trigger off a catastrophic race for new eapons of global destruction, the appeal said. In this context, quoting from the appeal, he said the US should conduct no further tests until "there is negotiation along the lines of the Reykjavik meeting and the Delhi Declaration". He pointed out in US itself 62.4 percent of nuclear scientists were against the SDI and therefore the argument that SDI was for self-defence was wrong. [Text] [New Delhi PATRIOT in English 30 Jan 87 p 3] /9274

CSO: 5150/0091

CONCERN INCREASES OVER RADIATION-CONTAMINATED FOODSTUFFS

Amman JORDAN TIMES in English 4 Mar 87 p 3

[Article by Salameh B. Ne'matt]

[Text] AMMAN — Barring foul play, Jordanians need not worry about radioactive contamination resulting from the consumption of imported powder milk or other foods from Europe in the wake of the Chernobyl nuclear disaster, according to officials at the Royal Scientific Society's Jordan Radiation Protection Labs (JRPL).

The officials sought to dispel public fears that imported foods may be contaminated following press reports of discoveries of radioactive contamination in imported foods in neighbouring countries.

Mr. Ali Ajlouni, in charge of the Non-Destructive Testing (NDT) division and head of the JRPL, said that the full-scale radiation detection checks of all imported food originating from Europe ceased on Jan. 1, 1987.

He said that JRPL, which became operational last year, now conducts contamination checks on nearly 20 to 30 different food items a day, with the exception of meat.

Mr. Ajlouni said that his staff make only "sporadic field visits" to meat import points in the Kingdom and make random checks on samples of these meats, at least once a week and on selected days.

Mr. Ajlouni's assurances notwithstanding, there was no way to ascertain that contaminated food is not being circulated in the market in between the sporadic checks.

'Foul play'

Furthermore, in theory, foul play cannot be ruled out. It has been demonstrated in the past, that exporters were able to export products into a certain country through a third party after faking the certificate of origin.

Mr. Ajlouni told the Jordan Times that foul play, such as the transfer of contaminated European food stuff to Jordan through a third, non-European country, constituted the only means of landing contaminated food in the Kingdom. "But that would be cheating," he said, adding that such exporters, if caught, would be subject to legal action and would damage their reputation. He said that such action would be a crime against humanity.

"Our focus is on imported powder milk and other concentrated food," Mr. Ajlouni said in an interview. He explained that the cycle starts by the contamination of grass which is grazed upon by cattle, whose milk and meat is consumed by people.

Radiation risks from Caesium 134 and 137 in radioactive material stays for as long as 30 years while Iodine 131 dissipates after a maximum period of two and a half months. Therefore, checks are now made only to detect Caesium in food products.

Quoting figures from a prepared report, Mr. Ajlouni said

that nearly 1,400 head of cattle, mostly imported from Romania and Bulgaria, were either destroyed or returned to the sender following detection of radioactivity from the Chernobyl accident. For the same reason, hay and thyme imported from Turkey was buried two metres deep in the Jordanian desert.

As a result of Jordan's strict radiation protection campaign, Mr. Ajlouni said, European exporters have been making sure that their Jordan-bound products are radiation-free.

Contaminated products in the UAE, Egypt

Contaminated food originating in Europe was detected last week in the United Arab Emirates, only after it had been circulated. The contaminated products were withdrawn from the market. In the same week, two cargo ships carrying 33.3 tonnes of contaminated food products were returned by the Egyptian government.

Contaminated West German milk exported to Egypt by private businessmen last month caused a public outcry and violent protests in both countries. Radioactive contamination was first discovered in Germany, and the milk was immediately destroyed in Egypt.

The JRPL had been carrying radiation protection tests on imported products after Chernobyl, using barely sufficient equipment, until it started receiving more sophisticated equipment six months ago.

With the help of the Vienna-based International Atomic Energy Agency, the RSS labs obtained the Gamma Spectroscopy monitoring machine and the Alpha-Beta counting system and other low level counting equipment for a more accurate measurement of radioactive contamination.

The JRPL has plans to set up early warning stations all over the Kingdom for the purpose of alerting concerned authorities in the event of a nuclear accident in the region that may effect the population. Such an early warning network could reduce the time needed for taking protective measures such as the evacuation of people from contaminated areas and urgent hospitalisation of injured citizens.

Nearly 40 hospitals and medical centres in the Kingdom are now under continuous JRPL observation and are subject to regular tests for the detection of harmful radiation leaks from radioactive medical equipment.

Tests in hospitals

A device known as TLD (Thermo Luminiscent Desometre), provided by the JRPL, is now carried by 619 operatives (330 in government hospitals) of medical equipment in these hospitals. The TLD, introduced in November last year, serves to measure the accumulative dose of radiation absorbed by personnel working with radiation-emitting equipment.

TLD devices are collected every three months to be processed by special equipment at the JRPL in order to determine the amount of accumulated radiation dose each one of the personnel manning radioactive medical equipment has absorbed.

Based on the results, and in the event of finding an operative who has been absorbing more than the acceptable level of radiation, the JRPL would recommend rotation of personnel, moving the operative into another section in the hospital or altogether ask him to change his job. This is usually accompanied by an investigation into the source of radiation in search for possible leaks.

The results from the first three months indicated that the exposure level of almost all of the 619 hospital personnel was in the safe bracket. The maximum permissible dose is 5,000 Micro Roentgen per year. Only one operative working at the Bashir Hospital recorded 2,000 Micro Roentgen for the three-month period and according to Mr. Ajlouni, there is an ongoing investigation into his case.

Radiation in phosphates

Mr. Ajlouni said that JRPL has also discovered radioactivity in phosphates and will soon be conducting a full test of the radiation level at the phosphate mines for the safety of workers at the plant.

JRPL is in need of supplementary equipment such as the "whole body counter" machine that specialises in measuring the level of radioactive material absorbed by the human body. There are three people working in the JRPL and the staff could be increased to 10 from the NDT division.

Threats to Jordan from a nuclear accident could emanate from any of several countries including Israel, Iraq, Egypt or any European country.

Mr. Hassan Khadra, director of the Technical Engineering Department of which JRPL is a part, said that the JRPL project was designed at the time of the establishment of the Royal Scientific Society to be a comprehensive national laboratory to detect any environmental pollution in the Kingdom.

/9317
CSO: 5100/4518

GANDHI VIEWS PAKISTAN'S NUCLEAR PROGRAM, ISSUES

BK030909 Delhi Domestic Service in English 0830 GMT 3 Mar 87

[Text] The prime minister has called for a full debate on separating religion from politics. Winding up the debate in the Lok Sabha today on the motion of thanks to the president for his address, Mr Rajiv Gandhi said that the nation is ready for such a debate, which would help in concretizing the issues pertaining to religion and politics. He sought the cooperation of the opposition in this task and said we all must face this challenge together. In this context, he referred to the All-Party Convention in Punjab, which has demonstrated that political parties can rise above party differences on issues of national importance. The Punjab accord has also helped in bringing together secular forces in the fight against communal and separatist forces out to destroy unity of the country.

Mr Gandhi said the Punjab accord proves that major national issues can be solved only through consensus. He thanked the opposition for cooperating with the government on arriving at a consensus on the Punjab problem. The prime minister stoutly defended the accords on Punjab, Assam, and Mizoram and described them as a major step forward in bringing to the fore the democratic process.

About the Assam accord, he said it has been worked out keeping in view the interests of Assam and the nation, but at the same time the center will not allow anything which will weaken the nation's integrity.

The prime minister reiterated that his government would continue to follow the path of socialism with a special role for the public sector. Specific programs will be modified from time to time to meet the needs and requirements of the country.

Referring to the state of economy, Mr Gandhi said the industrial growth rate is picking up and the foodgrains situation is comfortable; but the results are not what we would have liked them to be. Mr Gandhi underlined the need to bring about a new work ethos. The cost of implementing programs must be reduced. Another thrust area of the government is rural development and antipoverty programs.

Referring to Pakistan's nuclear program, the prime minister regretted that clandestine efforts to make nuclear weapons have been going on in spite of the safeguards against proliferation. He said it is quite extraordinary that the countries which are supposed to have safeguards are helping Pakistan in a massive arms buildup.

On the ethnic problem of Sri Lanka, Mr Gandhi said that continued violence has caused a setback to the process of a negotiated settlement. It has been made clear to the Sri Lankan Government that violence must be brought to an end before we can start again using our good offices.

Mr Gandhi referred to the border problem with China and said India wants a peaceful settlement.

/9274
CSO: 5100/4722

ZAIN NOORANI SAYS NUCLEAR PROGRAM TO CONTINUE

BK081549 Karachi Domestic Service in Urdu 1500 GMT 8 Mar 87

[Text] The National Assembly was assured today that Pakistan maintains a solid and clear policy regarding its peaceful nuclear program. Answering several adjournment motions, Minister of State for Foreign Affairs Zain Noorani also clarified that Pakistan cannot compromise the nation's sovereign rights. The adjournment motions had sought a discussion on the statement of the U.S. ambassador in Islamabad in which he had advised Pakistan to unilaterally sign the Nuclear Nonproliferation Treaty. The minister of state for foreign affairs assured that no power of the world can keep Pakistan from implementing its peaceful nuclear program. Pakistan is not ready to accede to any unilateral restriction nor will it accept any discriminatory attitude. It will rather prefer to renounce foreign aid. He declared Pakistan's peaceful nuclear program will go on no matter what sacrifices we may have to offer.

As for the friendship with the United States, it should be based on understanding. Any attempt to dictate or pressure will be inconsistent with the principles of friendship.

The adjournment motions were sought to be moved by Javed Hashmi, Sardar Asif Ahmed Ali Hamza, Mumtaz Ahmad Tarar, Mian Mohammad Zaman, Liaqat Baloch, Afaque Shahid, Syedah Abidah Hussain, M.P. Bhandara, and Sheikh Rashid Ahmed. The movers pressed their motions and sought a discussion on foreign policy and said that country's economy should be strengthened so that we may be able to face the challenge boldly. The members said Pakistan must continue with the implementation of its peaceful nuclear program to effectively meet the existing difficult energy situation. The discussion on these motions remained inconclusive as the time fixed for the adjournment motions had elapsed.

/8309
CSO: 5100/4723

UK DAILY CITED ON EXISTENCE OF NUCLEAR BOMB

OBSERVER Publishes Interview

BK010605 Hong Kong AFP in English 0550 GMT 1 Mar 87

[Excerpt] London, March 1 (AFP) — A Pakistani nuclear expert revealed that his country has a nuclear bomb and will use it "if our existence is threatened" in an interview published in Sunday's edition of *The Observer* newspaper.

The expert, identified in the newspaper as Professor Abdul Qadir Khan, head of a top-secret facility for the production of enriched uranium at Kahuta, near Islamabad, said Washington knew about the weapon. He added: "Let it be clear that we shall use the bomb if our existence is threatened." But he said he hoped Pakistan and India would not use nuclear weapons against each other. "Whatever arrangements India suggests, we are willing to accept, providing it is equally applicable to both," he commented.

Mr Khan, dubbed by *The Observer* the "father of the Islamic bomb," said his country had taken 7 years to develop an atomic weapon, compared with India's 12 years. [passage omitted]

Nuclear 'Expert' Denies Report

BK011639 Hong Kong AFP in English 1629 GMT 1 Mar 87

[Excerpt] London, March 1 (AFP) — A Pakistan nuclear expert was quoted by a British newspaper Sunday as saying his country had developed a nuclear bomb and would use the weapon "if our existence is threatened." *The Observer* quoted professor Abdul Qadir Khan, who it described as the head of a top-secret facility for producing enriched uranium at Kahuta, near Islamabad, as saying that Washingto[illegible]out Pakistan's bomb. He reportedly added: "Let it [illegible]at we shall use the bomb if our existence is threatened.

(But in Islamabad, Mr Khan called *The Observer*'s version of the interview "false and concocted" and denied that Pakistan had developed a nuclear weapon.

("Our modest research and development enrichment program is gaged only to meeting our growing energy requirements," he said in a statement published by the official Pakistan press agency.

(Referring to the interview, he said, "Some of my remarks have been taken out of context to mislead the world into believing that Pakistan possesses the nuclear weapons and that we have enriched uranium to 90 per cent or more."

(Pakistan's fuel enrichment program, he said, was solely aimed at providing commercial-grade uranium for the country's nuclear power program.

(Mr Khan said the interview in *The Observer* had been written by a journalist who called on him "without prior arrangement. Disclosure of this informal meeting and discussions is a breech of trust and is professionally unethical.") [passage omitted]

Spokesman Says Nuclear Policy 'Clear'

BK0211119 Karachi Domestic Service in English 1100 GMT 2 Mar 87

[Text] A Foreign Office spokesman said in Islamabad today that Pakistan's policy on the nuclear issue is abundantly clear. It calls for no further spread of nuclear weapons and for keeping South Asia in particular free from nuclear weapons. In pursuit of this commitment, he said, Pakistan is prepared to accept international inspection and safeguards on its own nuclear program in a global, regional, or bilateral context. The spokesman said this in the context of a reported interview of Dr A.Q. Khan, which has already been contradicted by the scientist himself. He said it is obvious that the Indian correspondent used devious means for obtaining access to Dr. A.Q. Khan in order to lend credibility to a transparently motivated piece of journalism.

/9274
CSO: 5100/4722

MUSLIM CARRIES INTERVIEW ON BOMB CAPABILITY

BK081059 Islamabad THE MUSLIM in English 1 Mar 87 pp 1, 5

[From Kuldip Nayyar]

[Text] New Delhi, Feb 28 — Pakistan has the bomb, Abdul Qadir Khan, "Father of the Islamic Bomb," would not actually say that, but what he told me should be enough testimony. "America knows it. What the CIA has been saying about our possessing the bomb is correct and so is the speculation of some foreign newspapers," he said.

The 51-year-old Mr Khan is hard to reach at his distant "two-bungalow" house, located in idyllic surroundings of mountains and woods in Islamabad. He is fond of birds, which abound at his residence. Strict security arrangements shield him and from nowhere guards and bulldogs appeared when I was still yards from his house.

"They told us that Pakistan could never produce the bomb and they doubted my capabilities, but they know we have done it," said Mr Khan. During an hour-long interview with me, the first to a foreign journalist, he referred specifically to an observation of Dr H.N. Sethna, when he was Chairman of India's Atomic Energy Commision three years ago, that Pakistan had neither the capability nor men to manufacture the bomb.

"Indeed, it was difficult, particularly when America and other Western countries had stopped selling anything which could be used in manufacturing the bomb," he said. Embargo was put on such small things as magnets and maraging steel. "But we purchased whatever we wanted before the Western countries got wind of it."

Mr Khan is taciturn but by no means modest. He is proud of what he has done in proving sceptics like Dr Sethna wrong. And so sure of himself that he does not bother to back off-repeated Pakistani denials that it has the bomb. But he would not allow me to tape-record the interview.

Why don't you announce that you have the bomb, I asked him point blank. "Is it necessary? America has threatened to cut off all its aid." "But you have not tested it yet?" "The testing does not have to be on the ground. It can be done in a laboratory through a simulator. Plans are flown after testing their capability in simulators."

Mr Khan said India had a bomb bigger than the one it exploded in Rajasthan on May 18, 1974. "You have not tested it on the ground but you have tested its capabilities otherwise," he said.

Mr Khan did not say when Pakistan actually came to possess the bomb. He mentioned that India took 12 years to make the bomb while he took only seven years. He returned to Pakistan from Holland in December 1975 and the Kahuta plant took three years to complete, that means that by December 1978 or the beginning of 1979, it was operational. If one were to add seven years, Pakistan could be said to have acquired the bomb either towards the end of 1985 or the beginning of 1986.

Making no pretence that Pakistan's nuclear programme was for peaceful purposes, Mr Khan said: "The word 'peaceful' associated with the nuclear programme is humbug. There is no "peaceful" bomb. After all, there is only a weak, transparent screen between the two, once you know how to make reactors, how to produce plutonium, all of which Pakistan has mastered, it becomes a rather easy task to produce nuclear weapons."

India's nuclear programme, according to Mr Khan, was not for peaceful purposes. In fact, he was very critical of India. "It is you who have forced us to go nuclear. The superpowers had to because of mutual fear. China being a big country had to make the bomb because both the Soviet Union and America had it. Why should you have done it? India had no such serious security problems: It had a friendship treaty with the Soviet Union. This was meant to threaten us, to establish its hegemony in the region. We were left with no alternative. In fact, it was as a result of the Indian betrayal of trust that the Canadians abrogated the agreement, he said.

Mr Khan, who by this time had given up the stance of talking in general terms, said that "Pakistan will not use it (the bomb) but if it is driven to the wall, there will be no option left in that eventuality. Nobody can undo Pakistan or take us for granted. We are there to stay and let it be clear that we shall use the bomb if our existence is threatened."

Mr Khan talked bitterly of Canada and France which, according to him, went back on "solemn agreements," the first cutting off all nuclear cooperation and refusing heavy water and the second backing off from the project for a reprocessing plant, even though it was to be set up under international safeguards. "America twisted France's arms," he said.

Was Kahuta the right site to choose for putting up the nuclear plant? Mr Khan got rather excited on the subject, "While outsiders would solely think of their convenience I had two prime factors in mind. The site should be out of normal traffic for security reasons and it should be near the Capital.

Another factor was the consideration of the facilities for my scientists and engineers. We never repented our decision and it is solely due to the selection of this site and my presence in the Capital that we managed to rush through our programme for more than three years before the Western countries came to know of it and embarked upon concerted and coordinated but unsuccessful, efforts to kill our infant programme."

Mr Khan ruled out the possibility of any attack on the plant. "Israel is not interested because we never come in its way, nor have we antagonised it one way or another. India is the only other country, but it knows what price it would have to pay for attacking Kahuta. In any case, the plant is well protected and we have not put all our eggs in one basket."

"I personally think that the only way to stop nuclear warfare between India and Pakistan is to come to an agreement. Whatever arrangement you suggest we are willing to accept provided it is applicable to both countries equally," he said.

Mr Khan said that Pakistan had been criticised for "stealing" things from abroad for its programme. "First let me make it clear we shall do anything in the national interest." He sounded angry when he recalled his trial in Holland for "stealing" information from there. (A case was initiated against him in Holland for writing two letters from Pakistan to two of his former colleagues. But he fought the case from Islamabad and prepared a brief case for the lawyer).

Mr Khan studied in Bhopal, where he was born, till 1952. Only then did his parents migrate to Pakistan. He earned a B.Sc. degree from Karachi University and went first to West Germany and then Holland to specialise both in metallurgy and physics. He is married to a Dutch, Mrs Henny Khan, and has two children, both girls.

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CSO: 5100/4723

FORMER MINISTER VOICES OPPOSITION TO BOMB

Lahore THE PAKISTAN TIMES in English 23 Feb 87 p 7

[Text]

LAHORE, Feb. 22: Dr. Mubashar Hassan, a former Federal Finance Minister and PPP leader, has said that Pakistan should try to make the forthcoming Geneva talks on Afghan issue a success and refuse to sign the Non-Proliferation Treaty unless India signed it.

Addressing a Press conference at his Gulberg residence here today, Dr. Mubashar said that the United States was pressurising Pakistan for signing the NPT unilaterally and delaying settlement on Afghan issue at Geneva talks. He said that the Government should make the Geneva talks successful as doing so was in national interest.

He said that the U.S. Government had already warned Pakistan against refusal to sign the NPT and threatened to discontinue military and financial aid. He said that the Pakistan Government should not give any secret assurance to the U.S. in connection with giving up peaceful atomic programme or ensuring continuation of American aid.

He said that Pakistan should not be cowed down by the threat of discontinuation of the American aid which was only a vehicle for the economic plunder of the aid-receiving countries. He said that Pakistan would not suffer much in the event of discontinuation of American aid. He said that the discointinuation of the aid would be a blessing indisguise for Pakistan and would help the country in embarking on the road of self-reliance and prosperity.

Answering a question, he said that he did not favour making of an atomic bomb by Pakistan.

/9317
CSO: 5100/4720

MINISTER STATES 'NO DESIRE' TO HAVE ATOMIC BOMB

BK050839 Karachi Overseas Service in English 0800 GMT 5 Mar 87

[Text] The minister in charge for science and technology, Mr Wasim Sajjad, categorically stated in the National Assembly today that Pakistan does not possess an atomic bomb, has no desire to have a bomb, and it cannot afford to manufacture an atomic bomb.

Replying to a question in the National Assembly, he said: The president, the prime minister, and other functionaries have repeatedly stated that our nuclear program is for peaceful purposes to meet our energy requirements.

Answering another question, he said negotiations with the Government of France are still continuing to comply with the contract for the reprocessing plant. The nuclear reprocessing plant for which a contract was entered into with the French Government was intended to cater to the energy needs. He said: At the moment, Pakistan has not requested any country for the supply of supercomputers.

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CSO: 5100/4722

READINESS TO ACCEPT NUCLEAR 'INSPECTIONS' EXPRESSED

BK021543 Karachi Domestic Service in Urdu 1500 GMT 2 Mar 87

[Text] Pakistan has expressed its firm determination to check the spread of nuclear weapons in South Asia. A Foreign Office spokesman said in Islamabad today that Pakistan's policy on the nuclear issue is abundantly clear and its basic objective is to prevent further proliferation of nuclear weapons. He said that Pakistan, in pursuit of its commitment, is prepared to accept international inspection and safeguards for its own nuclear program on a global, regional, or bilateral level. The spokesman said this is context of a reported interview of Dr. A.Q. Khan, which has already been contradicted by the scientist himself.

The spokesman said that it is obvious that the Indian correspondent used devious means to obtain access to Dr A.Q. Khan in order to lend credibility to a concocted story. This sinister report has been published at a time when the U.S. Congress is reviewing a new aid agreement for Pakistan. He said that the proposal to establish a nuclear-weapons-free zone in South Asia has been strongly and overwhelmingly supported in the UN General Assembly. Everyone knows which country in South Asia is opposed to this proposal. The spokesman said that Pakistan has presented several concrete proposals to attain the objective of checking the spread of nuclear weapons in South Asia. Additionally, Pakistan is ready to welcome any proposal, attend any conference, and participate in any consultation to establish a nuclear-free zone in South Asia.

/9274
CSO: 5100/4722

KHAN TALKS OF STRIDES IN NUCLEAR TECHNOLOGY

Islamabad THE MUSLIM in English 6 Feb 87 p 3

[Article by Tariq Butt]

[Text] Rawalpindi, Feb 5--Renowned Nuclear scientist Dr A.Q. Khan today said that Pakistan's success in uranium enrichment is of tremendous economic significance.

He told a reception here that this achievement was very important for defence purposes also. The doctor, who seldom makes public appearances, said the neighbouring India and some technologically-advanced Western countries started raising much hue and cry at our achievements in the uranium enrichment field, alleging that Pakistan was manufacturing Atom Bomb.

Dr Khan said President Zia had repeatedly made it clear that our achievements in the Nuclear sphere were directed toward peaceful purposes.

He said some Western nations vainly attempted to pressurise Pakistan to abandon its Nuclear programme after he revealed in 1984 that Pakistan had cracked the monopoly of the advanced states in this field.

"Our government was threatened with economic aid embargo and other sanctions if we continued our Nuclear programme. But we ignored the threats and moved ahead with our efforts to boost our Nuclear technology," Dr Khan told the clapping participants.

The eminent scientist claimed that Pakistan now ranked among seven or eight leading countries of the globe in the field of uranium enrichment. He said there was no doubt that the advanced nations wanted to keep Pakistan subservient in this field.

Dr Khan said he and his team had come up to the expectations of the nation. "We fulfilled the task entrusted by the people."

He said undoubtedly he and his colleagues encountered difficulties in the initial stages and it looked "impossible" for us to realise our goal. "Our friends and foes were equally skeptic about our achievement."

He recalled how some argued that "The man who had landed here from abroad has nothing to accomplish and he would hoodwink the nation."

Dr Khan, who had been recklessly and tirelessly maligned by the Western Press since his homecoming about a decade ago, said the mouths of those who used to doubt our humble effort had automatically been shut.

He said the Government provided all facilities to the scientists' team headed by him. "At times we faced odd obstacles. But we never informed the Government about them and continued with our efforts."

The scientist said the kind of project undertaken by him was of great importance for the nation. He said in the beginning, the small team of scientists had neither any infrastructural facilities nor experience in the field. "After the achievement with the dint of hard work, I have come to the conclusion that there is no dearth of true patriotic and competent people in our country."

Dr Khan exhorted the journalists not to write or comment on anything which was detrimental to the security and integrity of the country.

Wazir Ahmed Jogezai, Deputy Speaker, National Assembly, who presided over the reception, in his address lauded the "hero" for his spectacular achievements in Nuclear field. He said no doubt the country's defence was of much importance but added that the role played by the doctor was also of no less significance.

He stressed that Pakistan should manufacture Aton Bomb for defending its territorial boundaries effectively. He said the country should take forward its nuclear research programme and should not give it up at any stage.

/9317
CSO: 5100/4720

NUCLEAR TECHNOLOGY SAID TO REACH FARMS IN SIND

Karachi PAKATOM in English Oct-Nov 86 pp 3-4

[Text]

As a vivid manifestation of the peaceful applications of atomic energy, the PAEC's oldest agriculture research centre at Tandojam is playing a significant role in enhancing the quantity and quality of agricultural production.

In the Plant Genetics Division of the Atomic Energy Agricultural Research Centre, Tandojam, gamma radiation, fast neutrons and chemical mutagens, in combination with hybridization, are being gainfully used to evolve improved varieties of wheat, rice, cotton, sugarcance, soybean and mungbeans.

The Centre has achieved remarkable success in evolving high yielding wheat varieties. Jauhar-78, formerly known as mutant-115, can be cited as an outstanding example of the successful applications of nuclear techniques in agriculture. "Congratulations on the successful selection '115'. The mutant has increased yield through large sink in terms of more tillers, longer spikelets and more seeds per spike", remarked Dr. Alexander Micke, Head, Plant Breeding and Genetics Section, FAO/IAEA Division, Vienna, Austria. Mutant-115 was approved as variety Jauhar-78 by the Provincial Seed Council on 10 September 1979 for release to the farmers who received it with considerable enthusiasm as the variety promised plentiful harvests producing upto 6326 kg/ha (68.6 md/ac) as compared to the national average of 1482 kg/ha (16.1 md/ac), thus ensuring four times higher yields.

Another factor which contributed to the popularity of Jauhar-78 was its attractive amber colour. The mother variety Nayab had a dull dark colour which was generally not liked for 'chapati' making. Yet another factor which accounted for Jauhar-78's quick acceptance by the farmers was its resistance to shattering. Varieties introduced from Mexico often shatter under high temperature, and if threshing is delayed, farmers undergo considerable financial loss. No such losses are now being encountered by the planters of Jauhar-78.

Farmers also prefer disease-resistant varieties. Wheat variety Sind-81 developed at AEARC, Tandojam, is not only high yielding but also resistant to stem rust and leaf rust. The variety was approved for general cultivation in the province of Sind in 1982. It became an instant hit with the farmers who could increase their grain yield upto 8668 kg/ha (94 md /ac).

Multiple cropping is becoming popular in Pakistan. Farmers in Sind prefer wheat varieties which can be cultivated soon after cotton and rice. Variety Sarsabz, developed at Tandojam, is an outstanding example of plant breeding. The variety has genetic versatility and can be grown profitably after cotton and rice. In the coordinated national uniform wheat yield trials conducted by the Pakistan Agriculture Research Council, Sarsabz ranked first amongst all the candidate varieties at the national level under normal as well as short duration planting. Sarsabz was approved by the Provincial Seed Council as a new wheat variety for large scale cultivation.

These successes in developing new wheat varieties have lent a new impetus to the enthusiasm of the plant genetics team headed by Dr. Khushnood Ahmed Siddiqui, internationally known for his outstanding research in wheat genetics. A number of potential wheat varieties with improved characteristics are also in the pipeline. Whole chromosome substitution lines are being utilized in the genetic analysis of bread wheat. Species of *Aegilops*, *Triticum*, *Secale*, *Hordeum*, *Agropyron* and *Leymus* are being used in the genetic studies of salt tolerance and disease resistance. New germ plasm has also been produced and is being used in national and international breeding programmes.

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CSO: 5100/4725

BRIEFS

HERALD ON SOVIET NUCLEAR TESTS—The resumption of nuclear tests by the Soviet Union is the issue discussed by the HERALD. Although the paper commends the Soviet Union for suspending the tests since August 1985, it urges her to renew the embargo in the interest of global peace. The HERALD blames the United States for refusing to take similar action and says she cannot therefore escape responsibility for the future of the world and its security. [Text] [Lagos Domestic Service in English 0600 GMT 5 Mar 87] /8309

CSO: 5100/31

MARION ISLAND NUCLEAR TEST SITE CONSTRUCTION NOTED

Moscow IZVESTIYA in Russian 30 Dec 86 p 4

[Article by A. Krivopalov IZVESTIYA special correspondent: "The Fruits of Connivance: Will There Be a Nuclear Polygon on the South African Island of Marion?"; first paragraph is IZVESTIYA introduction]

[Text] London--The SAR is preparing to build an airstrip on Marion, its island in the Antarctic. Published on the pages of the London OBSERVER complete with clarifying explanations, this news is sure to provoke a broad political response the world over.

According to the newspaper account, the "silver dollar" in the Atlantic situated between the African continent and the Antarctic is to become an area in which the South African racists can continue nuclear weapons testing on a new and broader foundation.

Pretoria had apparently decided to use this island for strategic objectives much earlier. A continuing site for a South African research station manned by 25 people, Marion has been receiving several visits by suspicious guests over the last two months. According to the South African scientists who work there, these visits have come from military officials of both the SAR and Israel, who were particularly interested in the possibility for constructing an airfield.

Old press accounts confirm the fact that there are intentions of constructing a nuclear test site on Marion. Newspaper reports about a nuclear device having been exploded in this area in 1979 came to light even earlier.

Looking back on this, distinguished nuclear physicist F. Barnaby, who commented on the sensational news for the OBSERVER, believes that the airstrip is necessary precisely for "military objectives."

Having learned that plans were in the works for constructing an airstrip, the South African scientists at the scientific station on Marion became curious to know just why. Pretorian authorities cited the reasons as being "to improve medical service on the island, to be able to evacuate personnel in case of emergency and to render assistance to aircraft in emergency situations."

There is a link between the nuclear tests which the SAR is reported to have conducted in 1979 and Israel. There are many factors which indicate that a close cooperation has already been established in this area. Revelations made in the British press by Israeli technician M. Vanunu, who works at the nuclear center, today provide evidence of an even more alarming military alliance between Tel Aviv and Pretoria. Hauled off by Mosad agents and brought before a closed court in Tel Aviv on charges of high treason, Vanunu wrote, for example, that Israeli nuclear experts frequently visit South Africa.

This calls to mind something else as well. Although the SAR officially denies having any nuclear weapons, its rulers have refused to put their signature to the Nuclear Proliferation Treaty.

Doctor F. Barnaby, who earlier headed the Stockholm International Peace Research Institute (SIPRI), believes that Marion might become a site for testing missiles with nuclear warheads. A natural question arises: Are these secret military preparations by both terrorist countries a complete mystery to Washington and London, their main protectors, or are we here faced with a new, more dangerous example of connivance?

Late-breaking story:

The UPI reports that SAR authorities are taking tough steps to prevent any news about the so-called research center Pretoria is creating on the Antarctic island of Marion 1,900 kilometers away from Capetown from getting in the press.

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CSO: 5100/017

ZIONIST AMBITIONS TO POSSESS NUCLEAR ARMS EXPLAINED

Minsk SOVETSKAYA BELORUSSIYA in Russian 21 Jan 87 p 3

[Article by V. Zelenevskiy, junior research worker at the Institute of Philosophy and Law of the Belorussian SSR Academy of Sciences: "Zionist Nuclear Ambitions"; first paragraph is source introduction]]

[Text]--Minsk--I saw a report in the press that Israel is dying to possess nuclear weapons. Tell us about this in more detail. -- V. S. Shakhalevich

From the day Israel was founded, leaders in Tel Aviv have nurtured the idea of possessing nuclear weapons. Developments in the field of nuclear energy began in that country as early as 1952 under the leadership of a specially created commission on atomic energy directly subordinate to the prime minister. Right up until today, the numerous means of mass information which are under the control of the Zionists have been trying to convince world public opinion of the peaceful nature of nuclear research in Israel. The facts, however, say otherwise.

Zionists are supported in the possession of a nuclear threat by the assistance of the U.S. On 12 June, 1955 the U.S. provided the Zionist state with the first, 6 megawatt nuclear reactor which began operating in 1960 in city of Nahal Soreq.

Later, in 1962, yet another, 26 megawatt atomic reactor began operation in the Negev desert in Dimona. It was constructed under conditions of strictest secrecy with the help of French firms. The U.S. actively helped the Zionist state to carry out fundamental nuclear projects. In this, as in other similar matters, a hypocritical cover was indispensable. In 1955, having included Israel in a program of American aid in the nuclear sphere, Washington designated the program "The atom for peaceful needs."

Under this project, just between 1955 and 1966, more than 50 Israeli nuclear specialists completed a probationary period in the largest U.S. scientific institutions. A series of agreements were also signed which, in part, provided for the supply of american nuclear fuel to Israel. During the first years of cooperation in this field, Israel received 6-10 kilograms of Uranium 235 yearly from the U.S. The total had grown to 40 kilograms by 1966. Besides

that, the Weizmann Scientific Center for Nuclear Research [sic] in Rehovot received significant subsidies -- up to $350,000 a year.

Well known American atom-mongers became frequent guests in Tel Aviv. Even in the 60's, the "father" of the American hydrogen bomb, Edward Teller, visited there fairly often. After one of these visits, in an interview with a correspondent from the Johannesburg newspaper SUNDAY TIMES, he defiantly declared, "I visit Israel often. The Israelis tell me everything they know; I tell them everything I know. So don't look to me to tell you whether they have the nuclear bomb."

According to the newspaper NEW YORK TIMES (owned by the Zionist-Masonic family Sulzburger), even in the 60's the reactor in Dimona could produce a quantity of plutonium "fully sufficient to create 2 small nuclear bombs a year." The reactor in Nahal Soreq had a similar value. "From a military point of view, noted the Lebanese historian Jabir, the reactor in Nahal Soreq was valued as a base of study for nuclear research scientists and engineers. Enough plutonium was produced from Uranium 235 to create 3 or 4 bombs a year."

Not only the U.S., but also her NATO allies and the South African racists had a hand in creating the Israeli nuclear threat. For example, the delivery of nuclear "fuel" to Israel by these states was carried out under cover of supposed theft from warehouses or during sea transport by special forces from Tel Aviv.

In 1967 and 1968, Mossad, the Israeli intelligence service, created a special group to carry out raids on Western nuclear facilities. Under this Zionist designated program, a whole series of actions were carried out. In France, Israeli saboteurs, having distracted a driver, stole a 25 ton truck of uranium. The cargo was successfully transported to Israel. A similar operation was carried out in England. Obviously by arrangements with "competent" organs of the FRG, Mossad agents organized the theft of nuclear fuel from the West German vessel "Shersberg". As a result of this operation alone, 200 tons of uranium was delivered to the Israeli port of Haifa.

As early as 2 decades ago, the Zionists tried to use their nuclear trump card in relations with neighboring Arab states. Appearing in 1966 during debates in the Knesset, the head of the Israeli government, Shimon Perez said, "I know that the Arabs are suspicious of our nuclear intentions, and I know that this suspicion is our strength. For that reason, why should we dispel it? Why should we have to explain anything."

The first official statement on the availability of nuclear weapons to the Zionists was made in 1974. The then-president of Israel, Ephraim Katzir, declared to anyone who would listen, "We have always been striving to create our nuclear threat. Now we have it." Then another of his threats echoed: "Israel has a nuclear threat which the whole world must worry about." If you consider in this matter that the Zionist state categorically refused to join a pact on non-proliferation of nuclear weapons (also providing for guarantee against first strike), then the threatening nature of similar declarations becomes all the more obvious.

As was reported in the world press, during the 1973 war the Zionists were on the verge of being the first to employ a nuclear weapon in military action. The order to bring the weapon to combat readiness was issued by then-defense minister Moshe Dayan. As reported by the American magazine TIME, Israel manufactured 13 nuclear bombs only during the days of the 1973 October war alone, when the forces of the aggressor were in a difficult military position.

By shaking their nuclear fist in the Middle East region, the Zionists resort to open terror to foil peaceful nuclear research in the Arab countries. And they do this with their own distinctive cynicism.

In 1979, the government of Iraq purchased 2 atomic reactors from France, "Tamuz-1" and "Tamuz-2". But they were fated not to arrive at the designated place. Agents of Mossad blew them up along with 65 kilograms of active plutonium, right in the French navy shipyard in La Seyne. And when the French government supplied Iraq with new reactors and construction near Baghdad entered the completion phase in the summer of 1981, tney were destroyed by Israeli aircraft bombing strikes.

Even several Western states condemned this action by the Zionists. This is what (P. Burgo), the Canadian publicist wrote: "The time has come to force Israel to refrain from blackmail in international affairs. It is my opinion that Israel should be considered the same as all other countries in the world and must be forced to observe international rules of conduct."

Not only do the Zionists not draw the proper conclusions, however; more than that, they continue strenuously to accumulate lethal weapons. At the present time, according to a statement by the American professor (Perlmutter), who worked for a long time in the nuclear research center in Israel, there are 200 nuclear bombs in the Zionist arsenal.

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BRIEFS

IRRADIATED HAZELNUTS REFUSED BY UK--It is reported that two Turkish TIR [International Highway Transport] shipments of 40 tons of Turkish hazelnuts to England were turned away because the cargo had been irradiated. The British Customs Department, which asserted that the hazelnuts in the Turkish TIR shipments arriving at the British port of Dover last week had been poisoned by radiation twice the limit allowed by the EEC, called attention to the fact that accompanying documents stated the dangerous hazelnuts met Common Market standards. The customs department called this documentation "scandalous" and was critical of the lack of controls in countries through which the TIR shipments had passed. With the return of the Turkish hazelnuts to Turkey, the British have requested that all imported foodstuffs that undergo testing by private firms be inspected by the state in the future and that the inspection of pepper, which is used to prepare various foods, powdered milk, and dried vegetables and fruits be required as well. British experts, who reported that the production of hazelnuts fell off this year due to poor weather conditions, stated that the consumption of hazelnuts traditionally increased during the Christmas season and that their price on the market will rise this year because importation has been curtailed. [Text] [Istanbul HURRIYET in Turkish 10 Nov 86 p 15] 11673/9599

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